SOIL SURVEY OF

Barnwell County, South Carolina, Eastern Part

United States Department of Agriculture
Soil Conservation Service
In cooperation with
South Carolina Agricultural Experiment Station and
South Carolina Land Resources Conservation Commission

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in the period 1967-72. Soil names and descriptions were approved in 1973. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1973. This survey was made cooperatively by the Soil Conservation Service, the South Carolina Agricultural Experiment Station, and the South Carolina Land Resources Conservation Commission. It is part of the technical assistance furnished to the Barnwell Soil and Water Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps could cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms, ranches, and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Barnwell County, Eastern Part, are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability classification of each. It also shows the page where each soil is described and the woodland group in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be collored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the capability units and woodland suitability groups.

Foresters and others can refer to the section "Woodland," where the soils of the county are grouped according to their suitability for trees.

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in Barnwell County, Eastern Part, may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the information about the county given at the beginning of the publication and in the section "Additional Facts about the County."

Cover: Farm pond is on Lumbee loamy sand. Coastal bermudagrass pasture in background is on Blanton sand, 6 to 10 percent slopes.

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SOIL SURVEY OF BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART

BY VERGIL A. ROGERS, SOIL CONSERVATION SERVICE

SOILS SURVEYED BY VERGIL A. ROGERS, DANIEL D. MONTS, AND E. E. CROW, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE SOUTH CAROLINA AGRICULTURAL EXPERIMENT STATION AND THE SOUTH CAROLINA LAND RESOURCES CONSERVATION COMMISSION

BARNWELL COUNTY, EASTERN PART, is in the Southern Coastal Plain Land Resource Area. It is near Georgia and is about 80 miles from the Atlantic Ocean (fig. 1). The survey area is characterized by nearly level, broad ridgetops and gently sloping to rolling areas that are adjacent to narrow flood plains along the streams. Major soils on the ridges and more gentle slopes are Blanton, Dothan, and Fuquay. Johnston soils are the most common on the flood plains.

About 132,000 of the total 354,000 acres in Barnwell County are part of the Savannah River Plant controlled by the Atomic Energy Commission and are not included in the survey. The total area surveyed is about 222,000 acres. About 25 percent of this area is cultivated, 10 percent is in pasture or hay, 60 percent is woodland, and 5 percent is used for urban and other nonfarm purposes. The chief income is from cotton, soybeans, corn, melons, livestock, and forest products. Barnwell County, Eastern Part, has been recognized as one of the leading watermelon producing areas in the Nation. Watermelons and cantaloupes constitute an important part of the economy.

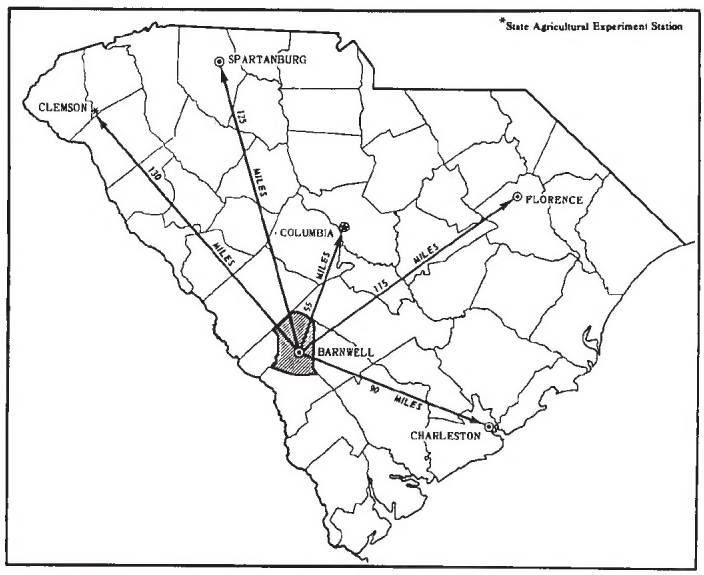

Figure 1.—Location of Barnwell County in South Carolina.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Barnwell County, Eastern Part, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes; the size and speed of streams; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Fuquay and Blanton, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface layer and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such

differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Fuquay sand, 0 to 2 percent slopes, is one of several phases within the Fuquay series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series or of different phases within one series. The undifferentiated group is an example of such a mapping unit in Barnwell County, Eastern Part. It is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. Thus, an area shown on the map may be made up of only one of the dominant soils or of two or more. An example of an undifferentiated group is Johnston soils. A large part of the mapped area consists of soils of the Johnston series. Other soils, however, are mapped with the Johnston soils. They are similar to Johnston soils but have more sand throughout.

While a soil survey is in progress, soil scientists take soil samples needed for laboratory measurements and for engineering tests. Laboratory data from the same kind of soil in other places are also assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kind of soil. Yields under defined management are estimated for all the soils.

Soil scientists observe how soils behave when used as a growing place for native and cultivated plants and as material for structures, foundations for structures, or covering for structures. They relate this behavior to properties of the soils. For example, they observe that filter fields for onsite disposal of sewage fail on a given kind of soil, and they relate this to the slow permeability of the soil or its high water table. They see that streets, road pavements, and foundations for houses are cracked on a named kind of soil, and they relate this failure to the high shrink-swell potential of the soil material. Thus, they use observation and knowledge of soil properties, together with available research data, to predict limitations or suitability of soils for present and potential uses.

After data have been collected and tested for the key, or benchmark, soils in a survey area, the soil scientists set up trial groups of soils. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others. They then adjust the groups according to the results of their studies and consultations. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under current methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Barnwell County, Eastern Part. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a survey area, who want to compare different parts of a survey area, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage and other characteristics that affect their management.

The soil associations in Barnwell County, Eastern Part, are discussed in the following pages. Information about the soils in each of the five soil associations is given in the section "Descriptions of the Soils."

The associations of Barnwell County, Eastern Part, do not join those of Bamberg County General Soil Map along much of the common boundary. The Varina-Fuquay-Dothan association in Barnwell County, Eastern Part, for example, joins the Marlboro-Faceville association in Bamberg County. Soils mapped as Marlboro in Bamberg County are very similar to those mapped as Varina in Barnwell County, Eastern Part; however, the content of plinthite of soils mapped as Marlboro was not recognized in Bamberg County. The Fuquay-Blanton-Dothan association in Barnwell County, Eastern Part, joins the Lakeland-Eustis association in Bamberg County. The present description of Blanton soils encompasses those mapped as Eustis soils in Bamberg County. The proportion of Fuquay, Dothan, and Lakeland soils in these joining associations varies.

1. Johnston Association

Nearly level, very poorly drained soils that are dominantly loamy throughout

This association consists of long, narrow areas that border streams. The soils are subject to frequent flooding. Texture, color, and thickness of layers in these soils vary within short distances.

This association makes up about 9 percent of the survey area. Johnston soils make up about 75 percent of the association and minor soils about 25 percent.

Johnston soils are very poorly drained. Their surface layer is black mucky loam about 28 inches thick. Below it is very dark gray sandy loam.

The minor soils in this association are the poorly drained Plummer, Lumbee, and Rembert. These soils are in low, flat areas or in depressions. They are farther away from streams than the Johnston soils.

The soils in this association are wooded. Native trees include gum, cypress, and bottom-land hardwoods. Pine, waxmyrtle, and other water-tolerant vegetation are present in places. The soils are poorly suited to cultivated crops. They have severe limitations when they are used for pasture, as a source of foundation material for roads, or as a site for septic-tank filter fields. The soils in this association are not suited to dwellings, industrial sites, or to any recreation areas other than those used for water-related sports.

Boating and fishing are popular on the larger streams in this association. In places diked areas can be managed as duck ponds. Areas of this association provide habitat for squirrels, raccoons, otters, bobcats, and deer.

2. Varina-Fuquay-Dothan Association

Nearly level to sloping, well-drained soils that have a sandy surface layer and a clayey or loamy subsoil

This association is on broad upland ridges and plains and in a few small oval and irregular shaped depressions, many of which have no defined outlets. It is dissected by a few well-defined drainageways that originate within the area. These drainageways have short sloping sides and narrow bottoms.

This association makes up about 40 percent of the survey area. Varina soils make up 23 percent of the association, Fuquay soils 22 percent, Dothan soils about 10 percent, and minor soils 45 percent.

Varina soils have a surface layer of dark grayish-brown loamy sand about 8 inches thick. The subsoil is yellowish-brown and brownish-yellow sandy clay that contains plinthite.

Fuquay soils have a surface layer of grayish-brown sand about 10 inches thick over a light yellowish-brown sand subsurface layer about 12 inches thick. The subsoil is yellowish-brown and strong-brown sandy clay loam that contains plinthite.

Dothan soils have a surface layer of grayish-brown loamy sand about 7 inches thick. The subsoil is mostly yellowish-brown sandy clay loam that contains plinthite below a depth of about 33 inches.

The minor soils are Vaucluse, Rembert, McColl, Blanton, Orangeburg, and Faceville. Vaucluse soils are on short breaks, and Rembert and McColl soils are in low, wet areas. Blanton soils are on ridges with the Fuquay and Dothan soils. Orangeburg and Faceville soils are generally on broad, high ridgetops.

About 50 percent of the total area of the soils in this association is cultivated, about 10 percent is idle or in pasture, and about 40 percent is wooded. Cotton, corn, small grain, soybeans, and peaches are the common crops. The average size of a farm is less than 400 acres. The farms are generally operated by their owners, and special crops are generally not raised. A few dairies are present in the association. Several industrial plants have been built on soils of this association in recent years (fig. 2).

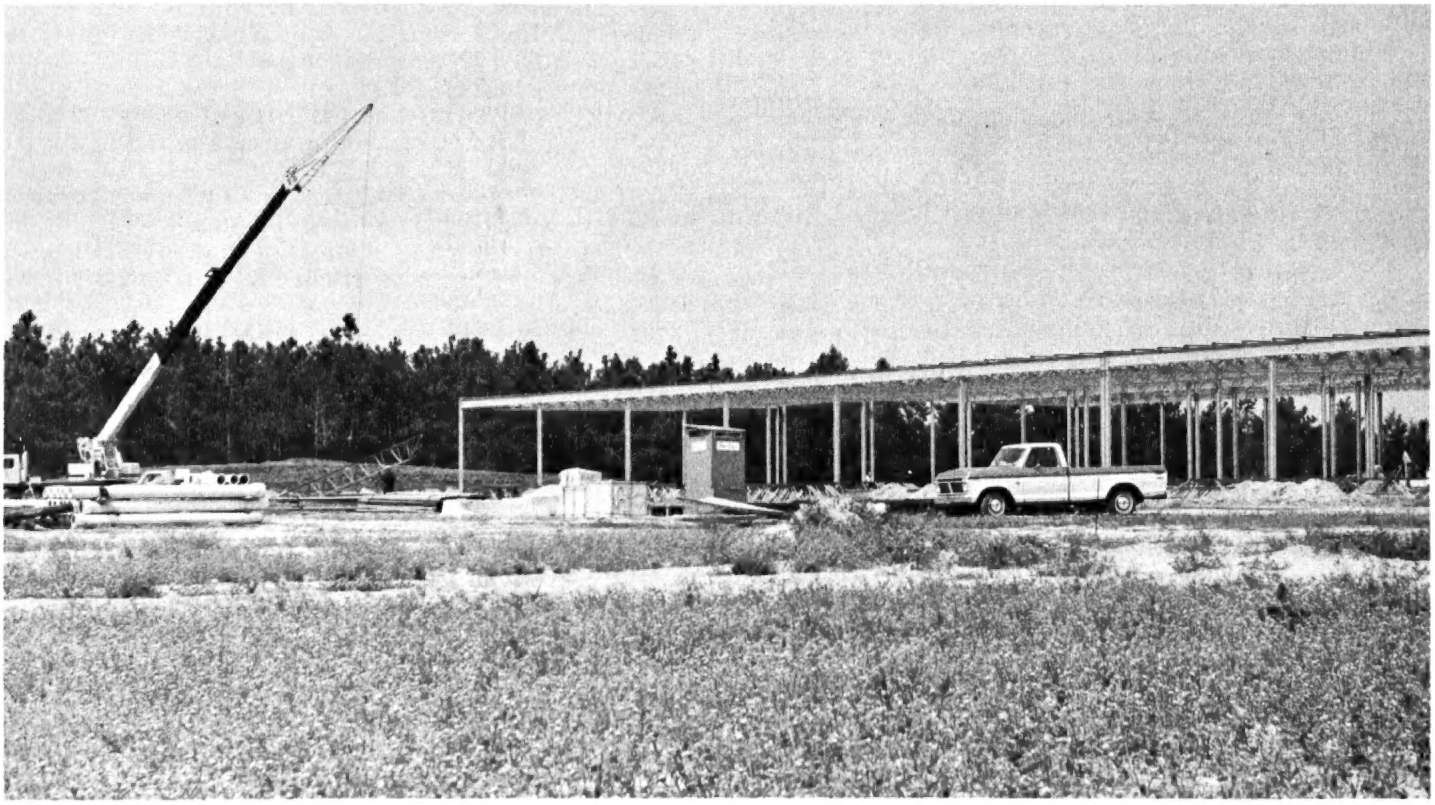

***Figure 2.*—A new industrial plant replaces cultivated crops on Varina loamy sand, 0 to 2 percent slopes.**

The major soils are well suited to most locally grown crops. The hazard of erosion is moderate on these soils. Conservation practices are needed in cultivated fields.

In places good pond sites are available for stock water and recreation. These soils are generally suited to quail, dove, and rabbit habitats. The association is suited to pine trees; however, some windthrow can be expected where root development is restricted.

3. Blanton-Fuquay-Lakeland Association

Nearly level to sloping, well-drained soils that have a sandy surface layer and a loamy subsoil, and excessively drained soils that are sandy throughout

This association is mostly in the western part of the survey area, but one area of it is almost south of Hilda. The soils are on broad plains which have a few oval-shaped depressions that lack well-defined outlets. The depressions range from 5 to 75 acres in size. Several creeks originate in this association.

This association makes up about 19 percent of the survey area. Blanton soils make up 49 percent of the association, Fuquay soils 28 percent, Lakeland soils 5 percent, and minor soils 18 percent.

Blanton soils have a surface layer of light olive-gray sand about 6 inches thick. The subsurface layer is pale-yellow sand about 54 inches thick. The subsoil is yellowish-brown sandy loam and sandy clay loam. It extends to a depth of 80 inches or more.

Fuquay soils have a surface layer of grayish-brown sand about 10 inches thick. The subsurface layer is light yellowish-brown sand about 12 inches thick. The subsoil is yellowish-brown and strong-brown sandy clay loam that contains plinthite.

Lakeland soils are excessively drained. They have a surface layer of grayish-brown sand about 5 inches thick. The underlying material is various shades of yellow or brown sand that extends to a depth of 80 inches or more.

The minor soils are the well-drained Dothan, Orangeburg, and Varina; the moderately well drained Clarendon; the poorly drained Pelham and Rembert; and the very poorly drained Johnston.

Nearly 60 percent of this association is wooded. Trees produce most of the farm income. Most of the farmers in this association are employed in private industry. A large acreage that was once cultivated has reverted to pine forest or is idle. About 30 percent of this association is cultivated or in pasture. Corn, cotton, and soybeans are the main crops. Coastal bermudagrass and bahiagrass are the chief pasture grasses. About 10 percent is planted in watermelons once every 5 or 6 years and is idle between each planting. In general the soils of this association are poorly suited to farming.

This association is a natural habitat for small game and deer. The small cultivated areas surrounded by large wooded areas furnish food and cover. The more sandy soils have relatively low production potential for most shallow-rooted crops.

4. Fuquay-Blanton-Dothan Association

Nearly level to sloping, well-drained soils that have a sandy surface layer and a loamy subsoil

This association is in the eastern, central, and southern part of the survey area. The plains of this association are dissected by a few small drainageways that originate within the area. These drainageways have short, sloping sides and narrow bottoms.

This association makes up 30 percent of the survey area. Fuquay soils make up 39 percent of the association, Blanton soils 28 percent, Dothan soils 14 percent, and minor soils 19 percent.

Fuquay soils have a surface layer of grayish-brown sand about 10 inches thick. The subsurface layer is light yellowish-brown sand about 12 inches thick. The subsoil is yellowish-brown and strong-brown sandy clay loam that contains plinthite.

Blanton soils have a surface layer of light olive-gray sand about 6 inches thick. The subsurface layer is pale-yellow sand about 54 inches thick. The subsoil is yellowish-brown sandy loam and sandy clay loam. It extends to a depth of 80 inches or more.

Dothan soils have a surface layer of grayish-brown loamy sand about 7 inches thick. The subsoil is yellowish-brown sandy clay loam. It contains plinthite below a depth of about 33 inches.

The minor soils consist of the well-drained Ailey, Vaucluse, and Orangeburg; the moderately well-drained Clarendon; and the poorly drained Lumbee, McColl, and Plummer. Ailey and Vaucluse soils have a fragipan. They are on the more sloping breaks near drainageways. Clarendon soils are on the rims of depressions. Lumbee, McColl, and Plummer soils are in lower depressions. Many areas of minor soils are in oval-shaped depressions 5 to 50 acres in size.

About 25 percent of the total area of soils in this association is cultivated or is in pasture. The rest is wooded or has been recently planted to pine trees. The average size of a farm is about 90 acres. The farms are operated by owners on a part-time basis. The main source of income is from row crops. Lesser amounts of income are derived from cattle, swine, truck crops, and timber products.

The sandier soils are better suited to pasture, trees, and watermelons than to other crops. Watermelons are planted once every 5 years or more, and the land is idle or in grass between each planting. If drained, the minor soils in the depressions are suited to pasture and some truck crops.

Wildlife management practices need to be selected on the basis of the terrain. Soils in depressions are not well suited to most perennial food plantings. A few depressions are suited to duck ponds, and some sites are suitable for fish ponds. The association is suited to hunting. The soils generally provide sufficient food and cover for quail, dove, rabbits, deer, and turkey.

5. Rembert Association

Nearly level, poorly drained soils that have a loamy surface layer and a clayey subsoil

This association is in oval or irregularly shaped depressions that have poor outlets for drainage. The soils are

subject to frequent ponding if adequate drainage is not provided.

This association makes up about 2 percent of the survey area. Rembert soils make up 90 percent of the association and minor soils 10 percent.

Rembert soils have a surface layer of very dark gray loam about 5 inches thick. The subsoil is light-gray clay.

The minor soils are of Clarendon, Duplin, McColl, Pelham, and Plummer. Clarendon and Duplin soils are better drained and are generally near the outside rim of the wet soils. McColl soils have a fragipan in the subsoil. Pelham and Plummer soils formed in association with more sandy soils.

Rembert soils are difficult to drain where they have formed in the middle of large areas of higher lying, well-drained soils. The natural vegetation consists of gums, cypress, hardwoods, pond pine, waxmyrtle, and other water-tolerant vegetation. Limitations are placed on these soils because of wetness. Some truck crops are well suited where adequate drainage is provided.

These soils are suited to some wildlife, mainly as a source of cover. Excess water often forces quail to leave the area if some drainage is not provided. The association is a natural habitat for rabbits and many birds. It is not suited to dwellings, industrial sites, or to most recreational uses because of poor drainage.

Descriptions of the Soils [1]

This section describes the soil series and mapping units in Barnwell County, Eastern Part. Each soil series is described in detail, and then, briefly, each mapping unit in that series. Unless it is specifically mentioned otherwise, it is to be assumed that what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any one mapping unit, it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile, that is, the sequence of layers from the surface downward to rock or other underlying material. Each series contains two descriptions of this profile. The first is brief and in terms familiar to the layman. The second is much more detailed and is for those who need to make thorough and precise studies of soils. Color terms are for moist soil unless otherwise stated. The profile described in the series is representative for mapping units in that series. If the profile of a given mapping unit is different from the one described for the series, these differences are stated in describing the mapping unit, or they are differences that are apparent in the name of the mapping unit.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of the description of each mapping unit are the capability unit and woodland group in which the mapping unit has been placed. The capability unit and woodland group for each soil can also be found by referring to "Guide to Mapping Units" at the back of this survey.

[1] C. A. HOLDEN, JR., conservation agronomist, Soil Conservation Service, assisted with the management section of each mapping unit.

TABLE 1.—*Approximate acreage and proportionate extent of soils*

Soil	Acres	Percent
Ailey sand, 6 to 10 percent slopes	2,000	0.9
Ailey sand, 10 to 15 percent slopes	700	.3
Blanton sand, 0 to 6 percent slopes	45,000	20.3
Blanton sand, 6 to 10 percent slopes	3,500	1.6
Clarendon loamy sand	1,650	.7
Dothan loamy sand, 0 to 2 percent slopes	7,000	3.2
Dothan loamy sand, 2 to 6 percent slopes	12,000	5.4
Dothan loamy sand, 6 to 10 percent slopes	2,000	.9
Dunbar sandy loam	300	.1
Duplin sandy loam, 0 to 2 percent slopes	400	.2
Faceville loamy sand, 2 to 6 percent slopes	1,400	.6
Faceville loamy sand, 6 to 10 percent slopes	2,000	.9
Fuquay sand, 0 to 2 percent slopes	23,000	10.4
Fuquay sand, 2 to 6 percent slopes	31,300	14.2
Fuquay sand, 6 to 10 percent slopes	3,000	1.3
Johnston soils	17,900	8.1
Lakeland sand, 0 to 6 percent slopes	3,000	1.3
Lakeland sand, 6 to 10 percent slopes	1,500	.7
Lumbee loamy sand	2,360	1.1
McColl loam	1,300	.6
Orangeburg loamy sand, 0 to 2 percent slopes	240	.1
Orangeburg loamy sand, 2 to 6 percent slopes	3,000	1.3
Orangeburg loamy sand, 6 to 10 percent slopes	2,500	1.1
Pelham sand	900	.4
Plummer loamy sand	3,500	1.6
Rembert loam	17,000	7.7
Varina loamy sand, 0 to 2 percent slopes	8,000	3.6
Varina loamy sand, 2 to 6 percent slopes	15,000	6.7
Varina loamy sand, 6 to 10 percent slopes	850	.4
Vaucluse loamy sand, 2 to 6 percent slopes	1,000	.4
Vaucluse loamy sand, 6 to 10 percent slopes	8,000	3.6
Vaucluse soils, 10 to 25 percent slopes	450	.2
Water (small ponds)	250	.1
Total	222,000	100.0

The acreage and proportionate extent of each mapping unit are shown in table 1. Many of the terms used in describing soils can be found in the Glossary at the end of this survey, and more detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (*9*).[2]

Ailey Series

The Ailey series consists of well-drained upland soils that are deep or moderately deep to a fragipan. They formed in loamy Coastal Plain sediment.

In a representative profile the surface layer is grayish-brown sand about 5 inches thick. The subsurface layer is very pale brown sand 25 inches thick. The upper part of the subsoil is strong-brown sandy clay loam about 11 inches thick. Below this is a firm, cemented, and brittle fragipan about 23 inches thick. The upper 10 inches of the fragipan is yellowish red and light yellowish brown. The lower 13 inches is reddish yellow and has yellowish-red and brownish-yellow mottles. Below the fragipan, the soil is mottled sandy clay loam to a depth of 74 inches.

Ailey soils are low in organic matter. Available water capacity is low to very low. Permeability is rapid in the

[2] Italic numbers in parentheses refer to Literature Cited, p. 50.

upper part and slow in the lower part. Surface runoff is slow.

Representative profile of Ailey sand, 6 to 10 percent slopes, about 6 miles southeast of Barnwell city limits on county road 58, and about 100 yards east of Hercules Creek near intersection of county roads 57 and 58:

Ap—0 to 5 inches, grayish-brown (10YR 5/2) sand; weak, fine, granular structure; very friable; many fine and few medium roots; medium acid; clear, smooth boundary.

A2—5 to 30 inches, very pale brown (10YR 7/4) sand; structureless; loose; few medium roots; few quartz pebbles; strongly acid; clear, wavy boundary.

B2t—30 to 41 inches, strong-brown (7.5YR 5/6) sandy clay loam; common, medium, distinct, yellowish-brown (10YR 5/8) and few, fine, distinct, yellowish-red mottles; moderate, medium, subangular blocky structure; friable; thin patchy clay films on ped faces; few fine and medium roots; few quartz pebbles; very strongly acid; abrupt, wavy boundary.

Bx1—41 to 51 inches, mottled yellowish-red (5YR 5/6) and light yellowish-brown (10YR 6/4) sandy clay loam; weak, coarse, subangular blocky structure; firm, cemented and brittle; few clay flows in cracks; few medium roots in upper part; strongly acid; gradual, wavy boundary.

Bx2—51 to 64 inches, reddish-yellow (7.5YR 6/8) sandy clay loam; many, medium, distinct, yellowish-red (5YR 5/6) and few, medium, distinct, brownish-yellow (10YR 6/6) mottles; massive; firm, cemented and brittle; 3 percent coarse quartz grains; strongly acid; gradual, wavy boundary.

B3—64 to 74 inches, mottled red (2.5YR 5/6), light-gray (10YR 7/2), brownish-yellow (10YR 6/6), and reddish-yellow (7.5YR 6/6) sandy clay loam; massive; firm; few quartz pebbles; very strongly acid.

The solum is more than 60 inches thick. Depth to the fragipan is 28 to 45 inches. The Ap horizon is medium acid or strongly acid and other horizons are strongly or very strongly acid.

The A1 horizon is 3 to 6 inches thick and is brown, grayish brown, dark grayish brown, very dark grayish brown, dark brown, or yellowish brown. The Ap horizon is 5 to 9 inches thick and is brown, grayish brown, or dark grayish brown. The A2 horizon is sand or loamy sand 20 to 30 inches thick. It is very pale brown, yellow, pale brown, light yellowish brown, brownish yellow, or pale yellow.

The B2t horizon is 5 to 12 inches thick and is yellowish brown, strong brown, or brownish yellow with red, yellowish-brown, yellowish-red, and brownish-yellow mottles.

The Bx horizon is sandy clay loam or sandy loam about 16 to 36 inches thick and more than 50 percent of it is cemented and brittle. It is yellowish red, yellowish brown reddish yellow, or strong brown with yellowish-brown, reddish-yellow, yellowish-red, red, and brownish-yellow mottles.

Below the Bx horizon is a B3 or C horizon that is sandy clay loam or sandy loam. The B3 horizon is mottled red, light gray, brownish yellow, reddish yellow, yellowish red, or strong brown.

Ailey soils occur with Fuquay, Blanton, and Vaucluse soils. Ailey soils have cemented and brittle layers that Fuquay and Blanton soils do not have. They lack the plinthite in Fuquay soils. Ailey soils have a thicker sandy A horizon than Vaucluse soils.

Ailey sand, 6 to 10 percent slopes (AeC).—This sloping soil has the profile described as representative for the series.

Included with this soil in mapping are small areas of Vaucluse, Blanton, and Fuquay soils. Also included are some areas that have a few rills as a result of erosion.

About 40 percent of this soil is cultivated. The rest is in trees or pasture, or is idle. The principal crops grown are cotton, soybeans, and corn. Bahiagrass and Coastal bermudagrass are used for permanent pasture.

Because the thick sandy surface layer has a low capacity to hold water, this soil is droughty. Erosion is a hazard where the soil is used for row crops. A cropping system that includes grasses and legumes or small grain most of the time is needed to help control erosion and maintain organic matter. Use of terraces, vegetated waterways, contour tillage, and crop residue also helps to control erosion. Windthrow of pines occurs due to poor root penetration in the fragipan. Capability unit IVs–2; woodland suitability group 4s2.

Ailey sand, 10 to 15 percent slopes (AeD).—This moderately steep soil is on short breaks of major drainageways.

Included with this soil in mapping are small areas of Blanton and Vaucluse soils. Also included are very small areas that are 5 to 10 percent plinthite in the subsoil, some areas with gullies 1 to 5 feet deep, and small areas at the heads of gullies where the surface layer is generally sandy loam or sandy clay loam.

Most of this soil is in pine trees or pasture of Coastal bermudagrass. Because of the slope and thick, sandy surface layer, this soil is seldom cultivated. Capability unit VIe–1; woodland suitability group 4s2.

Blanton Series

The Blanton series consists of deep, well-drained soils. These soils formed in loamy Coastal Plain sediment.

In a representative profile the surface layer is light olive-gray sand about 6 inches thick. The subsurface layer is pale-yellow sand 54 inches thick. The subsoil extends to a depth of 95 inches. Its upper 15 inches is yellowish-brown sandy loam that has red mottles. Below this, it is mottled, yellowish-brown, red, pale-yellow, and light-gray sandy clay loam.

Content of organic matter and available water capacity are low in Blanton soils. Permeability is rapid in the surface and subsurface layers and moderate in the subsoil. Runoff is slow.

Representative profile of Blanton sand, 0 to 6 percent slopes, 1 mile east of Barnwell city limits on South Carolina Highway 28, 200 yards south of road in woods:

A1—0 to 6 inches, light olive-gray (5Y 6/2) sand; weak, fine, granular structure; very friable; common large and many small roots; strongly acid; clear, smooth boundary.

A21—6 to 30 inches, pale-yellow (2.5Y 8/4) sand; structureless; loose; common small and few large roots; very strongly acid; gradual, wavy boundary.

A22—30 to 60 inches, pale-yellow (2.5Y 7/4) sand; few, fine, faint, yellowish-brown mottles; structureless; loose; strongly acid; gradual, wavy boundary.

B21t—60 to 75 inches, yellowish-brown (10YR 5/8) sandy loam; common, coarse, prominent, red (2.5YR 5/8) mottles; weak, fine, subangular blocky structure; very friable; sand grains coated and bridged with clay; 10 percent plinthite nodules; strongly acid; gradual, wavy boundary.

B22t—75 to 95 inches, coarsely mottled yellowish-brown (10YR 5/8), red (2.5YR 5/8), and pale-yellow (2.5Y 7/4) sandy clay loam; common, medium, distinct, light-gray (10YR 7/2) mottles; moderate, medium, subangular blocky structure; friable; very strongly acid.

The solum is 70 to more than 100 inches thick. The soil material is strongly acid or very strongly acid below the A horizon.

Thickness of the A horizon ranges from 40 to 70 inches. The A1 or Ap horizon is light olive gray, very dark grayish brown, grayish brown, dark grayish brown, dark yellowish brown, or brown. It is 4 to 10 inches thick. The very dark grayish brown color is in A1 horizons 4 to 6 inches thick. The A2 horizon is pale-yellow, pale-brown, very pale brown, or light yellowish-brown sand or loamy sand 36 to 60 inches thick.

The Bt horizon is yellowish-brown or brownish-yellow sandy clay loam or sandy loam. The Bt horizon extends to a depth of 80 inches or more. In places the soil material is 3 to 10 percent plinthite below a depth of 60 to 80 inches.

Blanton soils occur with Fuquay, Lakeland, and Dothan soils. They have a thicker sandy A horizon than Fuquay or Dothan soils. Blanton soils have a sandy clay loam or sandy loam B horizon at a depth of 40 to 70 inches, but Lakeland soils are sand throughout and lack a B horizon.

Blanton sand, 0 to 6 percent slopes (BaB).—This nearly level to gently sloping soil has the profile described as representative for the series.

Included with this soil in mapping are areas of Fuquay and Lakeland soils. Also included in some areas are soils that have a strong-brown or yellowish-red subsoil. In a few areas, 1 to 3 acres in size, the subsoil is 5 to 10 percent plinthite. In a few other small areas near slope breaks, a hard brittle layer is below a depth of 30 to 50 inches.

About 50 percent of the total area of this soil is wooded. The rest is in pasture, idle, or cultivated. The principal crops are Coastal bermudagrass (fig. 3), bahiagrass, watermelons, and soybeans. Pine trees have been planted on many of the areas.

This is a droughty soil. Controlling soil blowing and maintaining organic matter are management concerns when cultivating this soil. Rapid leaching of plant nutrients makes split applications of fertilizer essential. Wind stripcropping, cover crops, and cropping sequences that very frequently include crops of perennial grasses and legumes are needed to control erosion and replenish organic matter. Wind stripcropping and windbreaks are needed to control soil blowing on the cultivated ridgetops. Capability unit IIIs–1; woodland suitability group 3s2.

Blanton sand, 6 to 10 percent slopes (BaC).—This sloping or rolling soil is on narrow, high ridges and long, narrow areas parallel to streams and drainageways. Included in mapping are medium-sized areas of Fuquay and Lakeland soils and small areas of soils that have a fragipan in the subsoil.

About 80 percent of this soil is wooded. About 10 percent is cultivated, and the rest is idle or in pasture. Cultivated crops are watermelons, corn, and soybeans. Coastal bermudagrass and bahiagrass are grown for grazing and hay.

This is a droughty soil. Most plants that have a shallow root system do very poorly on this soil. Because of its rolling slopes this soil is less adaptable to row crops than the gently sloping Blanton soils. Intensive combina-

Figure 3.—Coastal bermudagrass is excellent for hay and grazing on Blanton sand, 0 to 6 percent slopes.

tions of stripcropping and perennial vegetation are essential when cultivating this soil. Capability unit IVe–1; woodland suitability group 3s2.

Clarendon Series

The Clarendon series consists of deep, moderately well drained soils on flats and around the rims of bays. These soils formed in loamy Coastal Plain sediment.

In a representative profile the surface layer is light brownish-gray loamy sand about 7 inches thick. The subsoil extends to a depth of 72 inches. In sequence from the top, it is 6 inches of light-yellowish-brown sandy loam; 17 inches of light yellowish-brown sandy clay loam that has reddish-yellow and gray mottles; 25 inches of mottled, yellowish-brown, pale-brown, and light-gray sandy clay loam that contains plinthite; and 17 inches of gray sandy clay loam that has reddish-yellow mottles.

Content of organic matter and available water capacity are moderate in Clarendon soils. Permeability is moderately rapid in the surface layer, moderate in the upper part of the subsoil, and moderately slow in the lower part of the subsoil. Runoff is slow.

A representative profile of Clarendon loamy sand, 1.2 miles east of Edisto Station Headquarters and 800 feet south of large bay:

Ap—0 to 7 inches, light brownish-gray (10YR 6/2) loamy sand; weak, fine, granular structure; very friable; common fine roots; few fine holes; strongly acid; clear, smooth boundary.

B1—7 to 13 inches, light yellowish-brown (10YR 6/4) sandy loam; weak, fine, subangular blocky structure; very friable; common fine roots; very strongly acid; gradual, wavy boundary.

B21t—13 to 30 inches, light yellowish-brown (10YR 6/4) sandy clay loam; common, medium, distinct, reddish-yellow (7.5YR 6/8) mottles and few, fine, faint, light-gray mottles; moderate, medium, subangular blocky structure; friable; thin, patchy, faint clay films on faces of peds; few fine holes and pores; very strongly acid; gradual, wavy boundary.

B22tg—30 to 55 inches, mottled, yellowish-brown (10YR 5/6), pale-brown (10YR 6/3), and light-gray (2.5Y 7/2) sandy clay loam; few, fine, prominent red mottles; moderate, medium, subangular blocky structure; friable; few fine holes and pores; sand grains coated and bridged; few pockets of clean sand; 15 percent plinthite nodules; very strongly acid; gradual, wavy boundary.

B3g—55 to 72 inches, gray (10YR 6/1) sandy clay loam; common, medium, distinct, reddish-yellow (7.5YR 6/6) mottles; weak, medium, subangular blocky structure; friable; very strongly acid.

The solum is more than 60 inches thick. The soil material is strongly acid or very strongly acid below the A horizon.

Thickness of the A horizon ranges from 5 to 18 inches. The A1 or Ap horizon is dark gray, light brownish gray, or dark grayish brown. Where an A2 horizon is present, it is light yellowish-brown, very pale brown, or pale-yellow sand or loamy sand 3 to 12 inches thick.

In some profiles there is a B1 horizon of sandy loam that is 2 to 6 inches thick. This horizon is light yellowish brown, brownish yellow, brown, or yellowish brown.

The Bt horizon is light yellowish brown, yellowish brown, or pale brown and has mottles of gray, yellowish red, and red in the upper 10 inches. It is 40 to more than 60 inches in thickness. A gray matrix is present between depths of 20 and 60 inches. In places the lower part of the Bt horizon is gray and is mottled with colors that have high chromas. The upper part of the Bt horizon is 2 to 5 percent plinthite. Below a depth of 30 to 40 inches this horizon is 5 to 20 percent plinthite.

Clarendon soils occur with Dothan, Varina, Dunbar, Rembert, McColl, and Lumbee soils. They are not so well drained as Dothan and Varina soils, and they have less clay in the B horizon than Dunbar soils. Clarendon soils are better drained than Rembert, McColl, and Lumbee.

Clarendon loamy sand (Cd).—This nearly level soil is in small depressions. Included in mapping are small areas of Dunbar, Duplin, Lumbee, McColl, Pelham, Dothan, Fuquay, and Varina soils.

Most areas of this Clarendon soil have been cleared and cultivated. Because of its low position in the landscape, this soil is subject to flash flooding. Also, a seasonal high water table is present 2 to 4 months of most years.

Open ditches and tile drains, or a combination of the two, are used to drain this soil. It may be farmed intensively year after year. If this soil is drained, maintaining an adequate content of organic matter becomes more important but also more difficult. Capability unit IIw–2; woodland suitability group 2w8.

Dothan Series

The Dothan series consists of deep, well-drained soils on uplands. These soils formed in loamy Coastal Plain sediment.

In a representative profile the surface layer is grayish-brown loamy sand about 7 inches thick. The subsurface layer is light yellowish-brown sand about 4 inches thick. The upper part of the subsoil, to a depth of 33 inches, is yellowish-brown sandy loam about 5 inches thick, and yellowish-brown sandy clay loam about 17 inches thick. The lower part, extending to a depth of 70 inches, is yellowish brown and strong-brown sandy clay loam that contains plinthite.

Content of organic matter is low in Dothan soils. Available water capacity is moderate. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Runoff is medium.

Representative profile of Dothan loamy sand, 2 to 6 percent slopes, 5 miles southwest of the town of Barnwell, 1½ miles west of the intersection of South Carolina Highway 3 and County Road 69, in planted pines:

Ap—0 to 7 inches, grayish-brown (10YR 5/2) loamy sand; weak, fine, granular structure; very friable; many, medium, pine tree roots; strongly acid; abrupt, wavy boundary.

A2—7 to 11 inches, light yellowish-brown (2.5Y 6/4) sand; weak, fine, granular structure; very friable; few large roots; strongly acid; clear, wavy boundary.

B1—11 to 16 inches, yellowish-brown (10YR 5/6) sandy loam; common, coarse, faint, brownish-yellow (10YR 6/6) mottles; weak, fine, subangular blocky structure; friable; bridging of sand grains and clay films on faces of some peds; few large roots; strongly acid; clear, wavy boundary.

B21t—16 to 33 inches, yellowish-brown (10YR 5/6) sandy clay loam; few, fine, prominent, red mottles; moderate, medium, subangular blocky structure; friable; sticky; thin continuous clay films; few medium roots; few, hard, ironstone nodules; strongly acid; gradual, wavy boundary.

B22t—33 to 50 inches, yellowish-brown (10YR 5/6) sandy clay loam; common, coarse, prominent, strong-brown (7.5YR 5/6) and red (2.5YR 4/6) mottles; weak, coarse, subangular blocky structure; firm; thin con-

tinuous clay films; few fine roots; few fine pores; about 20 percent plinthite and 5 percent hard ironstone nodules; strongly acid; gradual, wavy boundary.

B23t—50 to 70 inches, strong-brown (7.5YR 5/8) sandy clay loam; many, coarse, distinct, yellowish-red (5YR 4/6) mottles; few, fine, distinct, red mottles; and common, medium, prominent, light-gray (10YR 7/1) mottles; weak, coarse, subangular blocky structure; firm; thin, patchy clay films; common fine pores; about 25 percent plinthite and 5 percent ironstone nodules; few quartz gravel 2 to 15 millimeters in diameter; very strongly acid.

The solum is more than 60 inches thick. The soil material is strongly acid or very strongly acid below the A horizon. Ironstone pebbles range from 1 to 4 percent in the top 33 inches to as much as 10 percent in the lower part of the Bt horizon.

The A horizon is 6 to 18 inches thick. The Ap horizon is grayish brown, light brownish gray, pale brown, brown, or light yellowish brown. It is 5 to 10 inches thick. The A1 horizon is dark brown, very dark grayish brown, dark grayish brown, or dark gray and is 3 to 6 inches thick. The A2 horizon, where present, is light yellowish-brown, very pale brown, yellowish-brown, strong-brown, or brownish-yellow sandy loam loamy sand 4 to 12 inches thick.

The B1 horizon, where present, is yellow, yellowish-brown, or strong-brown sandy loam or light sandy clay loam. It is 3 to 6 inches thick.

The B2t horizon is 30 inches to more than 50 inches of yellowish brown, strong-brown, or brownish-yellow sandy loam or sandy clay loam. The lower part of the B2t horizon has pale-brown, light yellowish-brown, gray, red, and dark-red mottles. The B2t horizon is 5 to 30 percent plinthite.

The B3 horizon, where present, ranges from 5 to 20 inches in thickness. It is mottled, yellowish-red, strong-brown, red, gray, and yellowish-brown sandy loam or sandy clay loam.

Dothan soils occur with Varina, Fuquay, Faceville, and Blanton soils. They have less clay in the B horizon than Varina or Faceville soils. Dothan soils lack the thick, sandy A horizon of Blanton or Fuquay soils.

Dothan loamy sand, 0 to 2 percent slopes (DaA).—This nearly level soil is on broad ridgetops. Included in mapping are small areas of Fuquay and Varina soils; a few areas of soils on ridgetops that are 5 to 10 percent hard ironstone concretions in the surface and subsurface layers, and a few small areas ½ to 3 acres in size where the soils are not well drained.

Much of this soil is cultivated. The principal crops are soybeans, corn, cotton, and peanuts. Coastal bermudagrass and bahiagrass are used for hay and grazing.

Plinthite restricts movement of water and the development of roots in the layers where it is most concentrated. Soil blowing is a hazard. Wind stripcropping, crop residue management, use of sod crops in the cropping sequence, and use of windbreaks are practices that help to reduce the amount of wind damage and help to replenish organic matter. Capability unit IIs–2; woodland suitability group 2o1.

Dothan loamy sand, 2 to 6 percent slopes (DaB).—This gently sloping soil is on broad ridges and on fairly wide side slopes. It has the profile described as representative of the series.

Included with this soil in mapping are areas of Fuquay and Varina soils. In a few small areas the soils are less than 5 percent plinthite, and in a few areas that are ½ to 4 acres in size the surface layer is sandy clay loam or loam. Also, in a few small areas, the soils have a thick, sandy surface layer.

Most of the total area of this soil has been cultivated. The principal crops are soybeans (fig. 4), cotton, corn, and peanuts. Coastal bermudagrass and bahiagrass are grown for hay and grazing. Trees and other deep-rooted crops fail to produce proper root systems in the layers with concentrated plinthite.

Erosion is the chief hazard when cultivating this soil. Contour tillage, stripcropping, terraces, grassed waterways, and cropping sequences that include sod crops are some of the conservation practices that will aid in controlling erosion. Crop residue kept on or near the surface increases infiltration of water, adds organic matter, and reduces the hazard of erosion. Capability unit IIe–5; woodland suitability group 2o1.

Dothan loamy sand, 6 to 10 percent slopes (DaC).—This sloping soil is on long, narrow breaks parallel to drainageways.

Included with this soil in mapping are small areas of Ailey, Fuquay, and Vaucluse soils. Small areas of Ailey and Blanton soils are in transition to the more sandy soils. Spots of eroded soils 1 to 5 acres in size near the breaks and at heads of natural drainageways have a finer textured surface layer than that in the representative profile.

About half of this soil is in cultivation. The crops include soybeans, corn, and cotton. Some acreage has been planted in pines, and considerable acreage is idle or in trees of low commercial quality. Coastal bermudagrass and bahiagrass are grown for pasture and grazing. Root development and water movement are restricted in layers containing plinthite.

The hazard of erosion is severe on this soil. Contour tillage, terraces, grassed waterways, and cropping sequences that include frequent sod crops are some of the conservation practices that will aid in reducing the hazard of erosion. Such practices are essential if these soils are to continue to be productive. Capability unit IIIe–1; woodland suitability group 2o1.

Dunbar Series

The Dunbar series consists of deep, somewhat poorly drained soils on uplands. These soils formed in clayey Coastal Plain sediment.

In a representative profile the surface layer is dark-gray sandy loam about 7 inches thick. The subsoil extends to a depth of 60 inches. In sequence from the top, it is 14 inches of yellowish-brown sandy clay, 24 inches of light brownish-gray clay, and 15 inches of gray clay.

Dunbar soils are low in content of organic matter. Available water capacity is moderate, and permeability is moderately slow. Runoff is slow.

Representative profile of Dunbar sandy loam, 2 miles southwest of Blackville, and 1 mile south of U.S. Highway 78:

Ap—0 to 7 inches, dark-gray (10YR 4/1) sandy loam; weak, fine, granular structure; very friable; many fine roots and pores; medium acid; abrupt, smooth boundary.

B21t—7 to 21 inches, yellowish-brown (10YR 5/6) sandy clay; common, medium, distinct, light-gray (10YR 7/1) mottles; weak, fine and medium, subangular blocky structure; firm, sticky, hard; many fine roots and pores; thin patchy clay films; strongly acid; clear, wavy boundary.

Figure 4.—Soybeans grow well on Dothan loamy sand, 2 to 6 percent slopes.

B22tg—21 to 45 inches, light brownish-gray (2.5Y 6/2) clay; common, fine and medium, distinct, strong-brown (7.5YR 5/6) mottles and common, fine, prominent, gray, red, and yellowish-brown mottles; moderate, fine and medium, subangular blocky structure; firm, hard; few fine roots, holes, and pores; thin patchy clay films; strongly acid; gradual, wavy boundary.

B3g—45 to 60 inches, gray (10YR 6/1) clay; many, fine and medium, prominent, red (2.5YR 4/6) and strong-brown (7.5YR 5/6) mottles; moderate, fine and medium, subangular blocky structure; firm, plastic, hard; strongly acid.

The solum is more than 60 inches thick. The soil material is strongly acid or very strongly acid below the A horizon.

The A horizon is 5 to 12 inches thick. It is dark gray, dark grayish brown, gray, and grayish brown.

The B1 horizon, where present, is sandy loam or sandy clay loam 2 to 6 inches thick. It is pale brown, light yellowish brown, yellowish brown, and strong brown and has mottles of light brownish gray, gray, or light gray.

The B2t horizon is sandy clay or clay 30 to 45 inches thick. It is yellowish brown, light brownish gray, brownish yellow, strong brown, reddish yellow, and gray and has mottles of red, brown, and gray. A gray matrix is 15 to 30 inches below the surface.

The B3g horizon is sandy clay or clay that ranges from 5 to 20 inches or more in thickness. It is gray and has coarse mottles of yellow, brown, or red.

The clay content of the upper part of the B2t horizon of these soils is higher than that of the defined range for the series, but this has little effect on the usefulness or behavior of the soils.

Dunbar soils occur with Clarendon, McColl, and Rembert soils. They are more poorly drained than Clarendon soils and better drained than McColl or Rembert soils.

Dunbar sandy loam (Db).—This nearly level soil is in depressions or low, flat areas.

Included with this soil in mapping are small areas of Clarendon, Duplin, and Dothan soils. Also included are small areas of Rembert, McColl and Lumbee soils that are more poorly drained than this soil and medium-sized areas where the surface layer of the soil is loamy sand.

About 80 percent of the total area of this soil is cultivated. The rest is pastured or wooded. The principal crops are soybeans, corn, and truck crops.

Installing and maintaining an adequate drainage system is the chief management concern on this soil. A combination of open ditches and tile are used for drainage. If properly drained, this soil can be planted in row crops each year. A green-manure crop such as rye should be grown and plowed under to replace organic matter. Capability unit IIw-5; woodland suitability group 2w8.

Duplin Series

The Duplin series consists of deep, moderately well drained soils on uplands. These soils formed in clayey Coastal Plain sediment.

In a representative profile the surface layer is dark-gray sandy loam 8 inches thick. The subsoil extends to a depth of 72 inches. In sequence from the top, it is 17 inches of yellowish-brown sandy clay, 15 inches of light yellowish-brown clay, and 32 inches of gray clay.

Content of organic matter of Duplin soils is low, available water capacity is moderate, and permeability is moderately slow. Runoff is slow.

Representative profile of Duplin sandy loam, 0 to 2 percent slopes, in a cultivated field 3½ miles southwest of Blackville, 1 mile west of Barnwell State Park, and 30 feet north of dirt road:

Ap—0 to 8 inches, dark-gray (10YR 4/1) sandy loam; weak, fine, granular structure; many fine roots; medium acid; abrupt, smooth boundary.

B21t—8 to 25 inches, yellowish-brown (10YR 5/4) sandy clay; moderate, medium, subangular blocky structure; hard, firm, sticky; patchy distinct clay films on faces of peds; complete prominent clay films in wormholes and root cavities; many fine roots and pores; material from surface layer along vertical and horizontal faces of peds in upper part of horizon; strongly acid; clear, wavy boundary.

B22t—25 to 33 inches, light yellowish-brown (10YR 6/4) clay; many, fine and medium, prominent, yellowish-brown (10YR 5/8) and red (2.5YR 5/8 mottles and few, medium, distinct, light-gray (N 7/0) mottles; moderate, fine and medium, angular and subangular blocky structure; hard, firm, sticky; broken distinct clay films on faces of peds; common fine pores; very strongly acid; gradual, wavy boundary.

B23t—33 to 40 inches, light yellowish-brown (2.5Y 6/4) clay; common, medium and coarse, prominent, yellowish-brown (10YR 5/8), red (2.5Y 4/8) and gray (N 6/0) mottles; moderate, fine and medium, angular blocky structure; hard, firm, sticky; patchy faint clay films on faces of peds; very strongly acid; clear, wavy boundary.

B3g—40 to 72 inches, gray (N 5/0) clay; common, medium and coarse, prominent, red (10YR 4/6) mottles and few, fine, prominent, yellowish-brown mottles; massive; hard, very firm, sticky; very strongly acid.

The solum is 60 to 80 inches thick. The soil material is strongly acid or very strongly acid below the A horizon.

The A horizon is 3 to 10 inches thick. It is dark gray, grayish brown, brown, yellowish brown, dark brown, pale brown, or light yellowish brown.

The B1 horizon, where present, is sandy clay loam or sandy loam 3 to 6 inches thick. It is brown, yellowish brown, pale brown, or light yellowish brown.

The B2t horizon ranges from 25 to 50 inches or more in thickness. It is strong brown, brown, or yellowish brown and has mottles of gray, light gray, red, yellowish brown, and yellow. Most gray mottles start between depths of 20 and 30 inches.

The B3g horizon is 10 to 20 inches thick. It is coarsely mottled, light-gray, yellow, yellowish-red, brown, red, and strong-brown sandy clay, clay, or sandy clay loam.

Duplin soils occur with Dunbar, Varina, Dothan, Rembert, and Vaucluse soils. They are better drained than Dunbar or Rembert soils but not so well drained as Dothan, Varina, or Vaucluse soils.

Duplin sandy loam, 0 to 2 percent slopes (DpA).—This nearly level soil is in depressions or in flat, low areas.

Included with this soil in mapping are small areas of Dunbar, McColl, and Rembert soils that are more poorly drained than this soil. Also included are small areas of such better drained soils as Dothan and Varina, a few areas where the soil has sufficient plinthite or fragipan-like material to restrict maximum root development, and a few medium-sized areas where the soil has a surface layer of loamy sand or sand.

About 90 percent of the total area of this soil is cultivated or pastured, and 10 percent is wooded. The principal crops are soybeans, corn, cotton, and a variety of truck crops.

Installing and maintaining an adequate drainage system is the chief management concern. Open ditches, tile, or a combination of the two are used to remove excess water from this soil. If properly drained, this soil can be planted in row crops each year. A green-manure crop such as rye should be plowed under to replace organic matter. Capability unit IIw–5; woodland suitability group 2w8.

Faceville Series

The Faceville series consists of deep, well-drained soils on uplands. These soils formed in clayey Coastal Plain sediment.

In a representative profile the surface layer is grayish-brown loamy sand 7 inches thick. The subsoil extends to a depth of 72 inches. In sequence from the top, it is 23 inches of yellowish-red sandy clay, 20 inches of red sandy clay, and 22 inches of mottled, red, yellowish-brown, brownish-yellow, and light-gray sandy clay.

Content of organic matter is low in Faceville soils. Available water capacity is medium, and permeability is moderate. Runoff is medium.

Representative profile of Faceville loamy sand, 2 to 6 percent slopes, 2½ miles west of Blackville, 660 yards southwest of a dam on Edisto Experiment Station:

Ap—0 to 7 inches, grayish-brown (10YR 5/2) loamy sand; weak, fine, granular structure; very friable; many fine roots; many fine pores; very strongly acid; abrupt, smooth boundary.

B21t—7 to 30 inches, yellowish-red (5YR 5/8) sandy clay; weak, medium, subangular blocky structure; friable; common fine roots; patchy faint clay films on faces of peds; few, dark-brown, sesquioxide nodules; strongly acid; abrupt, wavy boundary.

B22t—30 to 50 inches, red (2.5YR 4/8) sandy clay; few, medium, prominent, brownish-yellowish (10YR 6/8) mottles; weak, medium, subangular blocky structure; friable, firm; patchy faint clay films on faces of peds; strongly acid; clear, wavy boundary.

B3—50 to 72 inches, reticulately mottled, red (2.5YR 4/8), yellowish-brown (10YR 5/5), brownish-yellow (10YR 6/6), and light-gray (10YR 7/2) sandy clay; massive; firm, hard; very strongly acid.

The solum commonly is more than 72 inches thick. These soils are strongly acid or very strongly acid below the A horizon.

The A horizon is 4 to 10 inches thick. It is brown, grayish brown, reddish brown, and yellowish red.

The B1 horizon, where present, is sandy loam or sandy clay loam 2 to 5 inches thick. It is yellowish red or red.

The B2t horizon is sandy clay or clay 35 to 60 inches thick. It is yellowish red or red.

The B3 horizon is 15 to 25 inches thick. It is coarsely mottled, red, yellowish-brown, strong-brown, gray, or light-gray sandy clay or clay.

In places the C horizon is at a depth of 60 to 80 inches. It is coarsely mottled, yellowish-red, reddish-yellow, light red-

dish-brown, reddish-brown, red, or light-red sandy loam or sandy clay loam.

Faceville soils occur with Dothan, Fuquay, and Varina soils. They have more clay in the B horizon than Dothan or Fuquay soils and lack the plinthite of Varina soils.

Faceville loamy sand, 2 to 6 percent slopes (FaB).—This gently sloping soil is on high ridgetops. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Dothan, Fuquay, and Varina soils. Also included are areas that have a surface layer of sandy loam.

Most of the total area of this soil is cultivated. The principal crops are cotton, soybeans, corn, and peanuts. Coastal bermudagrass and bahiagrass are grown for grazing and for hay. A few areas of this soil have been planted in pines.

Erosion is the chief hazard when cultivating this soil. Contour tillage, terraces, grassed waterways, and cropping sequences that include sod crops are some of the conservation practices that aid in controlling erosion. Crop residue kept on or near the surface increases infiltration of water, adds organic matter, and reduces the hazard of erosion. Capability unit IIe–2; woodland suitability group 3o1.

Faceville loamy sand, 6 to 10 percent slopes (FaC).—This sloping soil is on short, narrow breaks around drainageways. Included in mapping are small areas of Fuquay, Varina, and Vaucluse soils. Also included are small areas of soils that have a surface layer of sandy clay loam.

About 40 percent of the total area of this soil is cultivated, 20 percent is pastured, and the rest is wooded or idle. Cotton, corn, and soybeans are the principal row crops. Bahiagrass and Coastal bermudagrass are the chief pasture grasses. Some areas of this soil have been planted in pines.

Erosion is the chief hazard when cultivating this soil. Intensive erosion-control systems, including contour tillage, terraces, grassed waterways, and close-growing sod crops, are needed to avoid severe erosion if these sloping soils are cultivated. The sod crops plowed into the surface layer improve tilth, replace organic matter, and further help to reduce the hazard of erosion. Capability unit IIIe–2; woodland suitability group 3o1.

Fuquay Series

The Fuquay series consists of deep, well-drained soils on uplands. These soils formed in loamy Coastal Plain sediment.

In a representative profile the surface layer is grayish-brown sand about 10 inches thick. The subsurface layer is light yellowish-brown sand 12 inches thick. The upper part of the subsoil is yellowish-brown sandy loam 12 inches thick. The lower part, extending to a depth of 80 inches, is yellowish-brown and strong-brown sandy clay loam that contains plinthite.

Content of organic matter is low in Fuquay soils. Available water capacity is low. Permeability is rapid in the surface and subsurface layers, moderately rapid in the upper part of the subsoil, and slow in the lower part of the subsoil. Runoff is slow.

Representative profile of Fuquay sand, 2 to 6 percent slopes, 2 miles south of Edisto Experiment Station in a cultivated field about 400 feet northeast of county roads 116 and 191:

Ap—0 to 10 inches, grayish-brown (10YR 5/2) sand; weak, fine, granular structure; loose; few fine roots; strongly acid; abrupt, wavy boundary.

A2—10 to 22 inches, light yellowish-brown (2.5Y 6/4) sand; structureless; loose; strongly acid; gradual, wavy boundary.

B1—22 to 34 inches, yellowish-brown (10YR 5/6) sandy loam; weak, fine, granular structure; sand grains coated and bridged very strongly acid; gradual, wavy boundary.

B2t—34 to 52 inches, yellowish-brown (10YR 5/6) sandy clay loam; common, medium, faint, strong-brown mottles (7.5YR 5/6) and few, medium, prominent, red (2.5YR 5/8) mottles; moderate, medium, subangular blocky structure; friable; slightly sticky; thin continuous clay films; common fine pores; 15 percent plinthite and 5 percent ironstone concretions; very strongly acid; gradual, wavy boundary.

B3—52 to 80 inches, strong-brown (7.5YR 5/6) sandy clay loam; common, medium, distinct, red (2.5YR 4/8), gray (10YR 7/1), and yellowish-brown (10YR 5/8) mottles; weak, coarse, subangular blocky structure; friable; slightly sticky; thin patchy clay films; 10 percent plinthite and 5 percent hard ironstone concretions; very strongly acid.

The solum is more than 72 inches thick. The soil material is strongly acid or very strongly acid below the A horizon.

The Ap horizon is 6 to 12 inches thick. It is dark grayish brown, grayish brown, or brown. The A1 horizon is 3 to 8 inches thick. It is dark gray or very dark gray. The A2 horizon is sand or loamy sand 8 to 28 inches thick. It is pale yellow, light yellowish brown, yellow, or very pale brown.

The B1 horizon, where present, is sandy loam or loamy sand. It is yellowish brown, pale brown, brown, or strong brown.

The B2t horizon is 10 to 30 inches thick. It is yellowish brown, strong brown, or reddish yellow and contains plinthite.

The B3 horizon is sandy clay loam or sandy loam 5 to 30 inches thick. It is strong brown, yellowish brown, or reddish yellow; has mottles of gray; and contains plinthite.

Fuquay soils occur with Clarendon, Dothan, Varina, Plummer, McColl, and Rembert soils. They are better drained than Clarendon, Plummer, McColl, or Rembert soils. They have a thicker sandy A horizon than Dothan or Varina soils.

Fuquay sand, 0 to 2 percent slopes (FuA).—This nearly level soil has a thick sandy surface layer and has plinthite in the subsoil. Included in mapping are small areas of Blanton, Dothan, and Varina soils. Also included are small areas in depressions that are more poorly drained. These are shown by wet spot symbols.

A large percentage of this soil is cultivated. The rest is wooded or pastured. The principal crops are soybeans, corn, cotton, and peanuts. Watermelons and a few other truck crops are grown on this soil. Coastal bermudagrass and bahiagrass are the chief hay and grazing crops.

This soil is droughty. The large fields on high ridgetops are subject to soil blowing when left without cover. Large amounts of fertilizer and lime are required in split applications to maintain fairly high yields. Plowing a sod crop under reduces the amount of leaching, increases the available water capacity, and reduces the amount of damage caused by soil blowing. Stripcropping of close-growing plants also helps to reduce wind damage. Capability unit IIs–1; woodland suitability group 3s2.

Fuquay sand, 2 to 6 percent slopes (FuB).—This gently sloping soil has a thick sandy surface layer and

plinthite in the subsoil. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Dothan, Blanton, and Ailey soils. Also included are medium-sized areas where the surface layer is loamy sand and small areas where it is sandy loam.

Much of this soil is cultivated. The rest is pastured or wooded. The principal crops are cotton, soybeans, corn, and peanuts. The chief pasture grasses are Coastal bermudagrass and bahiagrass. Pines have been planted in most of the wooded areas.

This soil is droughty. Large amounts of fertilizer, lime, and organic matter are required to produce high yields. Soils in the large fields are subject to soil blowing, and short areas of more sloping soils are subject to water erosion. Tillage up and down slopes increases erosion and causes rills up to 20 feet wide and 1 to 2 feet deep to develop in these soils. To reduce the hazard of erosion and maintain production, such management practices as contour tillage, cropping sequences that include sod crops which are plowed into the soil, terraces, grassed waterways, and minimum tillage are used. Capability unit IIs–1; woodland suitability group 3s2.

Fuquay sand, 6 to 10 percent slopes (FuC).—This sloping soil has a thick sandy surface layer and contains plinthite in the subsoil. Included in mapping are small areas of Ailey, Dothan, Vaucluse, and Blanton soils. Also included are medium-sized areas of soils that have a surface layer of loamy sand.

Some of the area of this soil is cultivated, but much of it is wooded or idle. The rest is pastured. The principal crops are soybeans, cotton, corn, and watermelons. Coastal bermudagrass and bahiagrass are the chief pasture grasses. Pines have been planted in some of the wooded areas.

Erosion and droughtiness are concerns when managing this soil. Close-growing crops help maintain an adequate supply of organic matter and reduce the hazard of erosion. To further control erosion, intensive management systems that include terraces, vegetated waterways, contour tillage, and crop-residue management are needed. Capability unit IIIe–5; woodland suitability group 3s2.

Johnston Series

The Johnston series consists of deep, very poorly drained soils. These soils formed as loamy deposits of alluvium on first bottoms of streams that overflow. Water stands on these soils for long periods each year. No restrictive layer is above a depth of 60 inches in these soils.

In a representative profile the surface layer extends to a depth of 38 inches. The upper 28 inches is black mucky loam and the lower 10 inches is very dark gray sandy loam. The underlying material, to a depth of 60 inches, is dark-gray sandy loam.

Content of organic matter is very high in Johnston soils. Available water capacity is high. Permeability is moderate in the surface layer and moderately rapid in the underlying material. These soils are flooded for weeks each year, and runoff is very slow.

Representative profile of Johnston mucky loam in an area of Johnston soils, 2 miles west of Barnwell City limits, 0.4 mile southwest on County Road 20, and 200 feet northwest on flood plain of the Salkehatchie River.

A11—0 to 28 inches, black (10YR 2/1) mucky loam that is 10 percent organic matter; structureless; very friable; many, fine, medium, and large roots; very strongly acid; gradual, wavy boundary.

A12—28 to 38 inches, very dark gray (10YR 3/1) sandy loam; structureless; very friable; common medium roots; stratified sand pockets; very strongly acid; gradual, wavy boundary.

C—38 to 60 inches, dark-gray (10YR 4/1) sandy loam; structureless; loose; few medium roots; pockets of brown sand; very strongly acid.

The solum is 30 to 45 inches thick. The soil material is strongly acid or very strongly acid throughout.

The A horizon is 24 to 40 inches thick. It is black or very dark gray sandy loam, loam, or mucky loam. Content of organic matter is very high in the upper 12 inches of the A horizon.

The C horizon is sandy loam, loamy sand, or sand. It is gray, dark gray, or light gray. In this horizon are pockets of coarse sand and pockets of very dark gray material that is high in organic matter.

Johnston soils occur with Plummer and Lumbee soils. They have a thicker, darker A horizon than those soils.

Johnston soils (JO).—These nearly level, wet soils are near the creeks and rivers. The areas consist of Johnston and other very poorly drained soils. This unit was mapped at a lower intensity than other units in this survey. The pattern and extent of Johnston and other soils are not uniform. All areas are dominantly Johnston soils, but soils having greater sand content make up 10 to 40 percent of many areas. Small areas of Lumbee, Pelham, or Plummer soils are present in some of the mapped areas.

All of this soil is wooded. Most trees are water-tolerant hardwoods, and there are a few scattered pines.

Frequent flooding and high water table are severe hazards when managing this soil. Most areas cannot be drained and protected from flooding without excessive costs. This soil is suited to management of water-tolerant woodland species and wildlife. Capability unit VIIw–3; woodland suitability group 1w9.

Lakeland Series

The Lakeland series consists of excessively drained, deep sands. These soils formed in sandy Coastal Plain sediment.

In a representative profile the surface layer is grayish-brown sand about 5 inches thick. The underlying material is sand to a depth of 86 inches. The upper 4 inches is yellowish brown, the next 39 inches is light yellowish brown, the next 12 inches is pale yellow, the next 8 inches is very pale brown, and the lower 18 inches is pale yellow.

Content of organic matter is low in Lakeland soils. Available water capacity is very low, and permeability is rapid. Runoff is slow.

Representative profile of Lakeland sand, 0 to 6 percent slopes, about 5 miles west of Barnwell and north of Snelling and about 3,700 feet north of South Carolina Highway 64 and 3,000 feet northeast of graveyard.

A1—0 to 5 inches, grayish-brown (2.5Y 5/2) sand; weak, fine, granular structure; loose; common fine and large roots; medium acid; abrupt, smooth boundary.

C1—5 to 9 inches, yellowish-brown (10YR 5/4) sand; structureless; loose; strongly acid; gradual, wavy boundary.

C2—9 to 48 inches, light yellowish-brown (10YR 6/4) sand; structureless; loose; few fine and large roots; most sand grains coated; very strongly acid; gradual, wavy boundary.

C3—48 to 60 inches, pale-yellow (2.5Y 7/4) sand; structureless; loose; most sand grains uncoated; strongly acid.

C4—60 to 68 inches, very pale brown (10YR 7/4) sand; structureless; loose; sand grains commonly coated; very strongly acid; gradual, wavy boundary.

C5—68 to 86 inches, pale-yellow (2.5Y 7/4) sand; few, medium, distinct, yellowish-red (5YR 5/8) mottles; structureless; loose; very strongly acid.

The soil material is strongly acid or very strongly acid below the A horizon.

The A horizon is 3 to 9 inches thick. It is grayish brown, light brownish gray, brown, or dark grayish brown.

The C horizon is yellowish brown, light yellowish brown, pale yellow, very pale brown, or brownish yellow. In places at depths below 80 to more than 100 inches there are strata of loamy sand or sandy loam.

Lakeland soils occur with Blanton, Fuquay, Plummer, and Pelham soils. They are coarser textured throughout their profile than those soils; and, unlike those soils, they lack a B horizon. Lakeland soils are better drained than Plummer and Pelham soils.

Lakeland sand, 0 to 6 percent slopes (LaB).—This nearly level to gently sloping soil is on broad ridges or stream divides. It has the profile described as representative of the series.

Included with this soil in mapping are medium-sized areas of Blanton soils. Southeast of Blackville is a small area where the soil has a profile similar to that of this Lakeland soil except for an additional organic stained horizon.

About 85 percent of the total area of this soil is wooded, largely in hardwoods of low quality. Coastal bermudagrass is grown in some areas. Watermelons are planted in some areas, with the soil idle or in grass five or more years between each planting.

This soil is very droughty. It is subject to rapid leaching of plant nutrients. Maintaining content of organic matter and avoiding excessive leaching are serious management concerns. A cropping system that includes frequent close-growing crops helps to maintain organic matter and reduce the hazard of soil blowing. Rye is an excellent crop for stripcropping on this soil. Capability unit IVs–1; woodland suitability group 4s2.

Lakeland sand, 6 to 10 percent slopes (LaC).—This sloping or rolling soil is near streams and drainageways. Included in mapping are medium-sized areas of Blanton soils and small areas of Ailey and Vaucluse soils.

About 95 percent of the total area of this soil is wooded, largely in hardwoods of low quality. Small areas are planted in Coastal bermudagrass.

This soil is very droughty. It is subject to rapid leaching of plant nutrients. The low content of organic matter, rapid leaching of nutrients, and very low available water capacity are some of the management concerns. Capability unit VIs–1; woodland suitability group 4s2.

Lumbee Series

The Lumbee series consists of soils that are moderately deep over sandy underlying material and are poorly drained. These soils formed in bays and oval depressions in loamy Coastal Plain sediment.

In a representative profile the surface layer is black loamy sand about 3 inches thick. The subsurface layer is very dark gray and dark-gray loamy sand 5 inches thick. The subsoil is about 28 inches thick. In sequence from the top, it is 5 inches of light brownish-gray sandy loam, 17 inches of gray sandy clay loam, and 6 inches of gray sandy loam. The underlying material, to a depth of 60 inches, is light brownish-gray loamy sand.

Content of organic matter is moderate in Lumbee soils. Available water capacity is low, and permeability is moderate. These soils are under water at times, and runoff is very slow or ponded.

Representative profile of Lumbee loamy sand, about 1 mile east of Blackville and about 500 yards north of U.S. Highway 78 in bay:

A1—0 to 3 inches, black (N 2/0) loamy sand; weak, fine, granular structure; very friable; many fine roots; very strongly acid; clear, wavy boundary.

A2—3 to 6 inches, very dark gray (10YR 3/1) loamy sand; weak, fine, granular structure; very friable; common fine and few medium roots; very strongly acid; clear, wavy boundary.

A3—6 to 8 inches, dark-gray (10YR 4/1) loamy sand; weak, fine, granular structure; very friable; few fine roots; very strongly acid; clear, smooth boundary.

B1g—8 to 13 inches, light brownish-gray (10YR 6/2) sandy loam; few, fine, distinct, yellowish-brown mottles; weak, fine, subangular blocky structure; friable; thin, patchy, faint clay films; few medium roots; few medium holes; very strongly acid; clear, wavy boundary.

B2tg—13 to 30 inches, gray (10YR 6/1) sandy clay loam; few, fine, prominent, yellowish-brown mottles; moderate, medium, subangular blocky structure; friable; slightly sticky; thin clay films on faces of most peds; few medium roots; common large crayfish holes; few medium pores; very strongly acid; clear, wavy boundary.

B3g—30 to 36 inches, gray (10YR 6/1) sandy loam; few, fine, distinct streaks of yellowish brown in old root channels; weak, medium, subangular blocky structure; friable; thin patchy clay films on vertical faces of some peds; few large roots; few large holes; very strongly acid; gradual, wavy boundary.

Cg—36 to 60 inches, light brownish-gray (10YR 6/2) loamy sand; few, fine, prominent, olive-yellow mottles; massive; friable; thin, patchy, faint clay films on a few vertical cracks; very strongly acid.

The solum is 30 to 40 inches thick. The soil material is strongly acid or very strongly acid below the A horizon.

The Ap or A1 horizon is 3 to 8 inches thick. It is black, very dark gray, or dark gray. The A2 horizon, where present, is 3 to 6 inches of very dark gray, gray, or light brownish-gray sand or loamy sand. Where the A horizon is black or very dark gray, it is less than 10 inches thick.

The B2t horizon is 14 to 25 inches of light brownish-gray or gray sandy clay loam or sandy loam.

The B3 horizon is 3 to 12 inches of gray sandy loam or sandy clay loam. In places there are coarse mottles of yellowish brown, red, strong brown, or brownish yellow.

The C horizon is gray, light brownish-gray, or light-gray loamy sand or sand. It has mottles of pale brown, olive yellow, dark gray, or grayish brown.

Lumbee soils occur with Clarendon, McColl, Pelham, Plummer, and Rembert soils. They lack the plinthite content of Clarendon soils. Lumbee soils have less clay in the B horizon than McColl and Rembert soils. They lack the thick sandy A horizon of Pelham and Plummer soils.

Lumbee loamy sand (Lu).—This nearly level soil is in depressions. Included in mapping are small areas of Pelham, Rembert, McColl, Plummer, and Dunbar soils. Also included are very small areas of Clarendon soils on the outside edge of some depressions.

About 75 percent of the total area of this soil is wooded, 15 percent is pastured, and 10 percent is cultivated. If this soil is properly drained, it can be used for growing corn, sorghum, soybeans, and pasture grasses. Bahiagrass may be grown for hay or grazing.

A high water table and ponding are the chief hazards when cultivating this soil. It can, however, be cropped intensively if properly drained. Tile and some open ditches are used to drain the soil, but convenient outlets are not available in many places. Capability unit IIIw–4 (drained), Vw–1 (undrained); woodland suitability group 2w9.

McColl Series

The McColl series consists of poorly drained soils that are shallow or moderately deep to a fragipan. These soils formed in clayey Coastal Plain sediment.

In a representative profile the surface layer is black loam about 8 inches thick. The upper 12 inches of the subsoil is gray clay. Below this is a 10-inch fragipan of yellowish-brown, compact, brittle sandy clay that has mottles of gray and red. Below the fragipan the subsoil is coarsely mottled, yellowish-brown, light-gray, and red slightly brittle clay to a depth of 60 inches.

Content of organic matter is moderate in McColl soils. Available water capacity is low, and permeability is slow. Runoff is very slow or ponded.

Representative profile of McColl loam, 4½ miles northwest of Barnwell and 3,500 feet southwest of spot where gasline crosses U.S. Highway 278 in north end of 80-acre bay:

Ap—0 to 8 inches, black (10YR 2/1) loam; weak, fine, granular structure; very friable; common fine roots; strongly acid; abrupt, smooth boundary.

B21tg—8 to 14 inches, gray (N 6/0) clay; few, fine, prominent, yellowish-brown mottles; weak, fine, subangular blocky structure; firm, hard; few fine roots; few fine pores; patchy faint clay films on faces of peds; very strongly acid; clear, wavy boundary.

B22tg—14 to 20 inches, gray (5Y 6/1) clay; common, coarse, prominent, brownish-yellow (10YR 6/8) and red (10YR 4/8) mottles; weak, fine, subangular blocky structure; firm; few fine roots; few fine pores; patchy faint clay films on faces of peds; few fine plinthite nodules; very strongly acid; clear, wavy boundary.

Bx—20 to 30 inches, 75 percent yellowish-brown (10YR 5/8) sandy clay; common, medium, distinct, gray (10YR 6/1) mottles and few, medium, prominent, red (2.5YR 4/8) mottles; gray part in streaks 10 to 50 millimeters in diameter with higher clay and silt content than yellowish-brown part; weak, coarse, angular blocky structure; firm, hard, cemented, and brittle in yellowish-brown part; few, fine, plinthite nodules; very strongly acid; gradual, wavy boundary.

B3—30 to 60 inches, coarsely mottled, yellowish-brown (10YR 5/8), light-gray (10YR 7/1), and red (10YR 4/8) clay; massive; hard, firm (50 percent slightly compact and brittle); very strongly acid.

The solum is 36 to 60 inches thick. Depth to a fragipan is 16 to 30 inches. The soil material is strongly acid or very strongly acid below the A horizon.

The Ap or A1 horizon is 5 to 8 inches thick. It is very dark gray, very dark grayish brown, black, or dark gray.

The B2t horizon is 6 to 25 inches thick. It is gray, light-gray, light brownish-gray, grayish-brown, or dark-gray sandy clay or clay.

The Bx horizon is 8 to 30 inches thick. It is mottled, yellowish-brown, gray, red, strong-brown, light yellowish-brown, and brownish-yellow sandy clay or sandy clay loam. In most places the Bx horizon is 2 to 4 percent plinthite.

The B3 horizon is coarsely mottled, yellowish-brown, light-gray, gray, red, yellow, brown, and strong-brown sandy loam to clay.

McColl soils occur with Lumbee, Plummer, and Rembert soils. They have a higher percentage of clay in the B horizon than Lumbee or Plummer soils. They have a fragipan that is lacking in Rembert, Lumbee, and Plummer soils.

McColl loam (Mc).—This nearly level soil is in oval-shaped depressions that have no natural outlets. Included in mapping are small areas of Rembert, Lumbee, and Plummer soils and small areas of soils that have 5 to 10 percent less clay than is common for this soil. Also included are small areas of soils that have a surface layer of loamy sand, sandy loam, or clay loam.

About 60 percent of the total area of this soil is wooded or idle, 20 percent is cultivated, and 20 percent is in some type of grass. Soybeans, sorghum, and corn are the most commonly grown crops. Bahiagrass is planted in a few areas.

Excess of water as a result of a high water table and ponding is the chief hazard when managing this soil. In many cases tile does not adequately drain this low, wet soil, and open ditches must be used. Many areas do not have an outlet that is practical to use. If properly drained, this soil is productive, but some crop loss can be expected during years having above average rainfall. Some areas are suitable as dug ponds (fig. 5). Capability unit IIIw–2 (drained), Vw–1 (undrained); woodland suitability group 2w9.

Orangeburg Series

The Orangeburg series consists of deep, nearly level to sloping, well-drained soils on uplands. These soils formed in loamy Coastal Plain sediment.

In a representative profile the surface layer is brown loamy sand about 6 inches thick. The subsoil extends to a depth of 72 inches. In sequence from the top, it is 4 inches of strong-brown sandy loam, 43 inches of yellowish-red sandy clay loam, and 19 inches of red sandy clay loam.

Content of organic matter is low in Orangeburg soils. Available water capacity and permeability are moderate. Runoff is medium.

Representative profile of Orangeburg loamy sand, 2 to 6 percent slopes, about 2 miles northwest of Blackville on the Edisto Experiment Station; 0.3 mile east of paved road and 0.55 mile south of U.S. Highway 78 in a cultivated field:

Ap—0 to 6 inches, brown (10YR 4/3) loamy sand; weak, fine, granular structure; very friable; many fine roots; very strongly acid; abrupt, smooth boundary.

B1—6 to 10 inches, strong-brown (7.5YR 5/6) sandy loam; weak, fine, subangular blocky structure; friable, slightly hard and brittle; few fine roots; few fine holes and pores; strongly acid; clear, smooth boundary.

Figure 5.—A small area of McColl loam was excavated for this pond.

B21t—10 to 26 inches, yellowish-red (5YR 4/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; thin, patchy, faint clay films on faces of peds; common fine roots; strongly acid; clear, smooth boundary.

B22t—26 to 35 inches, yellowish-red (5YR 4/8) sandy clay loam; few, fine, faint, red mottles; moderate, medium, subangular blocky structure; friable; thin, patchy, faint clay films on faces of peds; few fine holes and pores; strongly acid; gradual, wavy boundary.

B23t—35 to 53 inches, yellowish-red (5YR 4/8) sandy clay loam; few, medium, distinct, red mottles and few, fine, distinct, strong-brown mottles; moderate, medium, subangular blocky structure; friable; thin, patchy, faint clay films on faces of peds; very strongly acid; gradual, wavy boundary.

B3—53 to 72 inches, red (2.5YR 4/6) sandy clay loam; many, coarse, prominent, yellowish-brown (10YR 5/8) mottles and few, fine, distinct, dark-red and gray mottles; moderate, medium, subangular blocky structure; friable; thin, patchy, faint clay films on faces of peds; few coarse uncoated sand grains and few soft plinthite nodules; very strongly acid.

The solum is 60 to more than 72 inches thick. The soil material is strongly acid or very strongly acid below the A horizon.

The Ap horizon is 4 to 8 inches thick. It is dark grayish brown, dark brown, brown, grayish brown, strong brown, reddish brown, or yellowish red. The A1 horizon, where present, is very dark gray or very dark grayish-brown loamy sand 3 to 7 inches thick. The A2 horizon, where present, is loamy sand or sand 3 to 12 inches thick. It is brown, strong brown, reddish yellow, light brown, or brownish yellow.

The B1 horizon, where present, is 3 to 15 inches of strong-brown or yellowish-red sandy loam or sandy clay loam.

The B2t horizon is 40 to 60 inches of yellowish-red, reddish-yellow, or red sandy clay loam or sandy loam.

The B3 horizon, where present, is 10 to 25 inches thick. It is yellowish-red or red sandy clay loam, sandy loam, or sandy clay that is mottled with dark red, strong brown, yellowish brown, and pale brown. A few fine gray mottles are common below a depth of 60 inches.

Orangeburg soils occur with Dothan, Blanton, and Vaucluse soils. They have a redder B horizon than Dothan or Blanton soils. Orangeburg soils lack the fragipan of the Vaucluse soils.

Orangeburg loamy sand, 0 to 2 percent slopes (OrA).—This nearly level soil occurs on broad ridgetops. Included in mapping are a few small areas of Dothan, Varina, Fuquay, and Faceville soils. Also included are small areas of soils that have a surface layer of sand or sandy loam.

Almost all of this soil is cultivated. The main crops are cotton, corn, soybeans, and peanuts. Some truck crops are grown. Coastal bermudagrass and bahiagrass are the chief pasture grasses.

This soil can be cropped intensively. Some soil blowing may occur on the larger fields if they are clean tilled. Sod crops are grown on this soil to replenish organic matter and reduce the amount of blowing. Capability unit I–1; woodland suitability group 2o1.

Orangeburg loamy sand, 2 to 6 percent slopes (OrB).—This gently sloping soil is on broad ridges and on some fairly narrow slopes along streams and drainageways. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Dothan, Varina, Fuquay, and Faceville soils and small areas of Clarendon soils that are not so well drained. Also included are small areas of eroded soils that have a surface layer of sandy clay loam.

Most of the total area of this soil is cultivated. The most common crops are cotton, soybeans, corn, and peanuts. Coastal bermudagrass and bahiagrass are the most common pasture grasses.

Erosion is the chief hazard when cultivating this soil. Contour tillage, stripcropping, and cropping sequences that include sod crops will control erosion on some fields. Others will require terraces and grassed waterways in addition to these management practices. Minimum tillage is desirable. Sod crops left on the surface or plowed into the surface layer are grown to replenish organic matter and reduce the hazard of erosion. Capability unit IIe–1; woodland suitability group 2o1.

Orangeburg loamy sand, 6 to 10 percent slopes (OrC).—This sloping soil is on long, narrow areas parallel to streams and drainageways.

Included in mapping are small areas of Vaucluse, Blanton, Ailey, and Dothan soils. Also included are medium-sized areas of soils that have slopes of slightly more than 10 percent or less than 6 percent. In about 10 percent of the mapped area the soil is eroded or severely eroded. Generally the eroded soils are on the steeper abrupt breaks in areas ½ acre to 5 acres in size.

About half of this soil is cultivated, and the rest is wooded and pastured. The most common crops are cotton, corn, and soybeans. Coastal bermudagrass and bahiagrass are the most common pasture grasses.

Erosion is the chief hazard when cultivating this soil. Terraces, contour farming, many vegetated waterways, and cropping sequences that include frequent close-growing sod crops are needed. Capability unit IIIe–1; woodland suitability group 2o1.

Pelham Series

The Pelham series consists of deep, poorly drained soils in oval depressions and in nearly flat transitional areas between the better drained and more poorly drained soils. These soils formed in loamy Coastal Plain sediment.

In a representative profile the surface layer is very dark gray sand about 7 inches thick. The subsurface layer is very pale brown sand 29 inches thick. The subsoil extends to a depth of 72 inches. It is gray sandy clay loam that is mottled with brownish yellow, olive yellow, and red.

Content of organic matter is moderately low in Pelham soils. Available water capacity is low. Permeability is rapid in the surface and subsurface layers and moderate in the subsoil. Runoff is slow.

Representative profile of Pelham sand, about three-fourths of a mile east of Blackville and about 200 yards south of U.S. Highway 78:

Ap—0 to 7 inches, very dark gray (10YR 3/1) sand; weak, fine, granular structure; loose; many fine roots; medium acid; abrupt. smooth boundary.

A2—7 to 24 inches, very pale brown (10YR 7/3) sand; few, fine, distinct, yellowish-brown mottles; weak, fine, granular structure; loose; few fine roots; strongly acid; gradual, wavy boundary.

A3—24 to 36 inches, very pale brown (10YR 7/3) sand; few, fine, distinct, brownish-yellow mottles and few, fine, faint, light-gray mottles; weak, fine, granular structure; loose; very strongly acid; gradual, wavy boundary.

B2tg—36 to 72 inches, gray (10YR 6/1) sandy clay loam; common, coarse, distinct, brownish-yellow (10YR 6/8) mottles; common, medium, prominent, weak-red (2.5YR 5/8) mottles and few. fine, distinct, olive-yellow mottles; weak, fine, subangular blocky structure; friable and sticky; thin patchy clay films on faces of peds; few fine roots in upper part; strongly acid.

The solum is 60 to more than 72 inches thick. The soil material is strongly acid or very strongly acid below the A horizon.

The Ap horizon is 5 to 8 inches thick. It is very dark gray, dark grayish brown, or dark gray. The A1 horizon, where present, is 3 to 6 inches thick. The A2 horizon is sand or loamy sand 15 to 30 inches thick. It is very pale brown, pale brown, light yellowish brown, brown, or pale yellow. A few gray mottles are present in this horizon. The A3 horizon, where present, is loamy sand or sand 6 to 15 inches thick. It is very pale brown, brown, light yellowish brown, or pale brown and has gray or light-gray mottles.

The B2tg horizon is 22 to 45 inches thick. It is gray and has mottles of brownish yellow, weak red, olive yellow, yellow, and light gray.

The A2 and A3 horizons have colors higher in chroma than is defined for the series, but this has little effect on the use, behavior, or management of the soils.

Pelham soils occur with Clarendon, Dunbar, Fuquay, and Blanton soils. They are more poorly drained than any of these soils, and they have a thicker A horizon than Clarendon or Dunbar soils.

Pelham sand (Pe).—This nearly level soil is on slight depressions and in transition to more poorly drained soils. Included in mapping are small areas of Plummer, Rembert, Lumbee, Clarendon, Blanton, and Fuquay soils.

About 75 percent of the total area of this soil has been cultivated, but most of it is presently idle or wooded. Corn and soybeans are the common cultivated crops.

Excess water during rainy seasons and droughtiness during dry seasons are concerns when cultivating this soil. A high water table occurs 3 to 6 months in most years, generally beginning early in spring. Tile drainage is used to remove excess water. Capability unit IVw–3; woodland suitability group 2w3.

Plummer Series

The Plummer series consists of poorly drained soils along intermittent drainageways, in slight depressions, and on low flat areas. These soils formed in loamy Coastal Plain sediment.

In a representative profile the surface layer is very dark gray loamy sand about 9 inches thick. The subsur-

face layer extends to a depth of about 50 inches. The upper 21 inches is light-gray sand, and the lower 20 inches is white sand. The subsoil, to a depth of 65 inches, is light-gray sandy loam that has strong-brown mottles.

Content of organic matter is moderate in the surface layer of Plummer soils and low below. Available water capacity is low, and permeability is moderately rapid. Runoff is slow, and ponding is frequent in most years.

Representative profile of Plummer loamy sand, about 2 miles northwest of Blackville, 400 feet south of U.S. Highway 78, and 0.7 mile east of Edisto Experiment Station headquarters in a large bay:

Ap—0 to 9 inches, very dark gray (10YR 3/1) loamy sand; weak, fine, granular structure; loose; common large and many medium roots; extremely acid; abrupt, smooth boundary.

A21—9 to 30 inches, light-gray (10YR 6/1) sand; common, medium, faint, brown (10YR 5/3) mottles; structureless; loose; few large roots; very strongly acid; gradual, wavy boundary.

A22—30 to 50 inches, white (10YR 8/2) sand; structureless; loose; few medium roots; few iron concretions; very strongly acid; clear, wavy boundary.

B2tg—50 to 65 inches, light-gray (10YR 7/1) sandy loam; few, fine, distinct, strong-brown mottles; weak, medium, subangular blocky structure; friable; thin, patchy, faint clay films; extremely acid; gradual, wavy boundary.

The solum is more than 60 inches thick. The soil material ranges from extremely acid to strongly acid.

The Ap horizon is 4 to 9 inches thick. It is very dark gray, dark gray, gray, light gray, light brownish gray, or black. The A2 horizon is sand or loamy sand 36 to 50 inches thick. It is light gray, gray, or white.

The B1 horizon, where present, is 3 to 15 inches of gray or light-gray sandy loam or loamy sand.

The B2tg horizon is 10 to 40 inches of light-gray to very dark gray sandy loam or sandy clay loam.

Plummer soils occur with Blanton, Lakeland, and Johnston soils. They are more poorly drained than Blanton or Lakeland soils. They lack the thick dark A horizon of the Johnston soils.

Plummer loamy sand (Pu).—This nearly level soil occurs on low, wet sandy flats. Included in mapping are small areas of Pelham, Lumbee, Johnston, McColl, and Rembert soils and very small areas of Clarendon, Blanton, and Fuquay soils.

About 90 percent of the area of this soil is in hardwood. Generally, these trees are of low quality.

Ponding, flooding, a high water table, and the thick, sandy, infertile subsurface layer are concerns when managing this soil. Generally, clearing and draining the soil are impractical tasks. Where the soil is properly drained and fertilized, bahiagrass may be grown for pasture. Rapid leaching of plant nutrients is a management concern. Capability unit IVw–3; woodland suitability group 2w3.

Rembert Series

The Rembert series consists of deep, poorly drained soils. These soils formed in loamy Coastal Plain sediment.

In a representative profile the surface layer is very dark gray loam about 5 inches thick. The subsoil is light-gray clay 28 inches thick. The underlying material, to a depth of 50 inches, is light-gray sandy clay loam.

Content of organic matter is moderate in Rembert soils. Available water capacity is moderate, and permeability is slow. Runoff is slow, and these soils are frequently ponded.

Representative profile of Rembert loam, 9 miles south of Barnwell and about 2 miles east of the Kline intersection in a bay 150 feet south of paved road:

Ap—0 to 5 inches, very dark gray (10YR 3/1) loam; weak, fine, granular structure; very friable; many fine roots; very strongly acid; abrupt, wavy boundary.

B2tg—5 to 33 inches, light-gray (10YR 6/1) clay; few, medium, distinct, red (2.5YR 4/8) mottles and common, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, fine, subangular blocky structure; firm and slightly plastic; continuous clay films on faces of peds; common fine and medium roots in upper part; strongly acid; clear, wavy boundary.

Cg—33 to 50 inches, light-gray (N 7/0) sandy clay loam; common, fine, prominent, yellowish-red (5YR 5/6) and strong-brown (7.5YR 5/6) mottles; massive; friable; slightly sticky; pockets of sand and loamy sand; few coarse quartz grains; very strongly acid.

The solum is 30 to 50 inches thick. The soil material below the A horizon is strongly or very strongly acid.

The A horizon is 4 to 8 inches thick. It is very dark gray, very dark grayish brown, or black.

The B1g horizon, where present, is gray or light-gray sandy loam to sandy clay loam. It is less than 10 inches thick.

The B2tg horizon is 15 to 30 inches of gray or light-gray sandy clay to clay. In many places this horizon has mottles of yellowish brown, strong brown, or yellowish red.

The B3 horizon, where present, is gray, light-gray, or white sandy loam to sandy clay loam. It contains large pockets of coarse sand, fine sand, or loamy sand.

The C horizon is loamy sand, sandy loam, sandy clay loam, or sand.

Rembert soils occur with McColl, Lumbee, Plummer, Dunbar, Duplin, and Clarendon soils. They are more poorly drained than Dunbar, Duplin, and Clarendon soils. Rembert soils lack the fragipan of McColl soils and have more clay in the B horizon than Lumbee or Plummer soils.

Rembert loam (Re).—This nearly level, wet soil is in low, flat, oval-shaped bays.

Included with this soil in mapping are small areas of Clarendon, Dunbar, Lumbee, and McColl soils and areas of a soil that has a clayey subsoil extending to a depth of 60 inches or more. Also included are small areas where the surface layer is sandy loam, loamy sand, or clay loam.

A small percentage of this soil is cleared, and 60 percent of the total acreage is wooded. The most common crops are corn, sorghum, soybeans, and some truck crops. Cucumbers grow well in this soil.

Excess water because of a high water table and ponding is the chief hazard when cultivating this soil. Proper drainage may require a combination of tile and open ditches. Outlets are not available or are not practical to use in many places. If properly drained, this soil is productive; but some crop loss can be expected during years having above average rainfall. Capability unit IIIw–2 (drained), Vw–1 (undrained); woodland suitability group 2w9.

Varina Series

The Varina series consists of deep, nearly level to sloping, well-drained soils on uplands. These soils formed in clayey Coastal Plain sediment.

In a representative profile the surface layer is dark grayish-brown loamy sand about 8 inches thick. The sub-

soil extends to a depth of 72 inches. In sequence from the top, it is 22 inches of yellowish-brown sandy clay, 12 inches of yellowish-brown sandy clay that has reddish-brown mottles and contains plinthite, and 30 inches of brownish-yellow sandy clay that has red and light-gray mottles and contains plinthite.

Content of organic matter is low in Varina soils. Available water capacity is moderate. Permeability is moderate above the part of the subsoil containing plinthite but is slow in the part that contains plinthite. Runoff is medium.

Representative profile of Varina loamy sand, 2 to 6 percent slopes, 1½ miles east of Blackville and about 900 feet north of railroad track in a cultivated field:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; very friable; common fine roots; 3 percent brown and reddish-brown pebbles of ironstone; slightly acid; abrupt, wavy boundary.

B21t—8 to 30 inches, yellowish-brown (10YR 5/8) sandy clay; moderate, medium, subangular blocky structure; firm; few fine roots; strongly acid; clear, smooth boundary.

B22t—30 to 42 inches, yellowish-brown (10YR 5/8) sandy clay; few, medium, prominent, reddish-brown (5YR 5/4) mottles; moderate, medium, subangular blocky structure; firm; complete, distinct clay films on faces of peds; few fine roots in upper parts; common brittle plinthite nodules that are 5 to 20 millimeters in size and have red or dark-red centers; strongly acid; clear, wavy boundary.

B23t—42 to 72 inches, brownish-yellow (10YR 6/8) sandy clay; common, medium, prominent, red (10YR 4/8) mottles and few, medium, distinct, light-gray mottles; weak, coarse, subangular blocky structure; friable; thin, patchy, faint clay films on vertical faces of some peds; few brittle plinthite nodules 5 to 15 millimeters in size; very strongly acid.

The solum is 60 to more than 72 inches thick. The Ap horizon ranges from slightly acid through strongly acid, and the other horizons are strongly or very strongly acid.

The A horizon is 4 to 10 inches thick. It is dark grayish brown, brown, or dark brown. A few ironstone pebbles are in the A horizon in some places. The A2 horizon, where present, is 2 or 3 inches of pale-brown or light yellowish-brown sand or loamy sand.

The B2t horizon is 45 to more than 60 inches. It is yellowish brown, brownish yellow, or strong brown. The upper part has mottles of yellowish red, reddish brown, or red, and the lower part has a few gray mottles. Plinthite amounting to 5 to 40 percent occurs below depths of 30 to 45 inches.

The B3 horizon, where present, is brownish yellow, yellowish brown, or strong brown, or is coarsely mottled with these colors and includes gray and red mottles. It is sandy clay or sandy clay loam.

Varina soils occur with Dothan, Faceville, Dunbar, and Duplin soils. They have a finer textured B horizon than Dothan soils. They have plinthite, which Faceville, Dunbar, and Duplin soils lack.

Varina loamy sand, 0 to 2 percent slopes (VaA).—This nearly level soil is on broad ridgetops. Included in mapping are medium-sized areas of soils that have a slightly coarser textured subsoil. Also included are small areas of Dunbar, Duplin, Clarendon, and Rembert soils which are shown by a wet spot symbol.

Much of the total area of this soil is cultivated. The chief crops are soybeans, cotton, and corn.

Soil blowing is a hazard when cultivating this soil. Plinthite restricts movement of water and the proper development of roots. Stripcropping with close-growing plants, rotations with sod crops, and windbreaks are practices used to reduce wind damage and replenish organic matter. Capability unit IIs–2; woodland suitability group 3o1.

Varina loamy sand, 2 to 6 percent slopes (VaB).—This gently sloping soil is on broad ridges and fairly wide slopes. It has the profile described as representative of the series.

Included with this soil in mapping are medium-sized areas of soil that has a slightly coarser textured subsoil than this soil. Also included are small areas of Clarendon, Dunbar, Duplin, and Rembert soils and soils with a fragipan along narrow, abrupt breaks.

A large part of this soil is cultivated. The rest is wooded or pastured. The principal crops are soybeans, cotton, and corn (fig. 6).

Erosion is the chief hazard when cultivating this soil. Contour tillage, terraces, grassed waterways, and cropping sequences that include sod crops are some conservation practices that aid in controlling erosion. Crop residue kept on or near the surface helps to increase infiltration of water, adds organic matter, and reduces the hazard of erosion. Capability unit IIe–2; woodland suitability group 3o1.

Varina loamy sand, 6 to 10 percent slopes (VaC).—This sloping soil is on the long, narrow breaks parallel to drainageways. Included with this soil in mapping are small areas of Dothan, Vaucluse, Ailey, and Faceville soils. Near the heads of drainageways are numerous spots of eroded soils 1 to 4 acres in size that have a finer textured surface layer than this soil.

Some of this soil is cultivated. The rest is wooded or pastured. Soybeans, corn, and cotton are the chief crops. Some acreage has been planted in pines, and some areas are in permanent pasture.

Erosion is the chief hazard when managing this soil. Contour tillage, terraces, grassed waterways, and cropping sequences that include frequent use of sod crops are some conservation practices that aid in controlling erosion. Crop residue kept on or near the surface helps to increase infiltration of water, adds organic matter, and reduces the hazard of erosion. Capability unit IIIe–2; woodland suitability group 3o1.

Vaucluse Series

The Vaucluse series consists of gently sloping to moderately steep, well-drained soils on uplands. These soils have a fragipan at a moderate or shallow depth. The soils formed in loamy Coastal Plain sediment.

In a representative profile the surface layer is dark-brown loamy sand about 6 inches thick. The upper part of the subsoil is reddish-brown sandy loam 7 inches thick over light-red sandy clay loam 6 inches thick. Below this is a firm, cemented, and brittle fragipan of red sandy loam. This pan is about 30 inches thick. Below it the subsoil is red coarse sandy loam to a depth of 80 inches.

Content of organic matter is low in Vaucluse soils. Available water capacity is low, and permeability is slow. Runoff is medium.

Representative profile of Vaucluse loamy sand, 2 to 6 percent slopes, 1.1 miles south of Edisto Experiment Station headquarters and 600 feet east of the west boundary of the station:

Figure 6.—Corn ready for harvest on Varina loamy sand, 2 to 6 percent slopes.

Ap—0 to 6 inches, dark-brown (10YR 4/3) loamy sand; weak, fine, granular structure; loose; few fine roots; slightly acid; abrupt, smooth boundary.

B1—6 to 13 inches, reddish-brown (5YR 5/4) sandy loam; weak, fine, subangular blocky structure; very friable; common fine roots; few fine holes; medium acid; clear, smooth boundary.

B2t—13 to 19 inches, light-red (2.5YR 6/8) sandy clay loam; few, medium, distinct, red (10YR 4/6) mottles; moderate, medium, subangular blocky structure; firm, slightly hard; common fine roots; thin, patchy clay films on faces of peds; very strongly acid; abrupt, wavy boundary.

Bx—19 to 49 inches, red (2.5Y 5/8) sandy loam; common, coarse, prominent, yellow (2.5Y 8/6) and yellowish-brown (10YR 5/8) mottles; massive; firm and brittle in 70 to 85 percent of the horizon; 4-inch horizontal band of white (10YR 8/1) kaolin clay at a depth of 43 inches; very strongly acid; clear, wavy boundary.

B3—49 to 80 inches, red (10YR 5/6) coarse sandy loam; massive; friable; pockets of reddish-gray (10YR 5/1) kaolin clay 5 to 10 millimeters in diameter; very strongly acid.

The solum is 40 to more than 80 inches thick. The Bt and Bx horizons are strongly acid to extremely acid.

The Ap horizon is 4 to 10 inches thick and is brown, dark brown, grayish brown, pale brown, or light yellowish brown. In areas that have not been plowed there is an A1 horizon that is 3 to 6 inches thick. This horizon is brown, dark brown, gray, grayish brown, or very dark grayish brown. The A2 horizon, where present, is 3 to 10 inches of yellow, brownish-yellow, reddish-yellow, or very pale brown sand or loamy sand.

The B1 horizon, where present, is 3 to 9 inches thick. It is reddish brown, yellowish brown, or strong brown.

The B2t horizon is 5 to 20 inches thick. It is red, light red, reddish brown, yellowish red, reddish yellow, strong brown, or yellowish brown.

The Bx horizon is red, yellowish red, reddish yellow, strong brown, or yellowish brown. It has irregular, long, narrow areas of gray, pinkish gray, very pale brown, or white that are more clayey and less brittle than the rest of the horizon. Texture ranges from sandy clay loam to coarse sandy loam. This horizon is cemented and brittle in 60 to 90 percent of the mass.

The B3 horizon, where present, is coarsely mottled, weak-red, red, yellowish-red, and gray sandy loam, coarse sandy loam, or sandy clay loam.

The C horizon, where present, is coarsely mottled, weak-red, red, yellowish-red, and gray coarse loamy sand to sandy loam.

Vaucluse soils occur with Ailey, Dothan, Fuquay, Orangeburg, and Varina soils. Unlike Dothan, Fuquay, Orangeburg, and Varina soils, Vaucluse soils have a fragipan. The Vaucluse soils lack the thick, sandy A horizon of the Ailey soils.

Vaucluse loamy sand, 2 to 6 percent slopes (VcB).—This gently sloping or undulating soil is on short breaks and narrow ridges around streams or drainageways. It has the profile described as representative for the series.

Included with this soil in mapping are small areas of Ailey, Dothan, Faceville, Fuquay, Orangeburg, and Varina soils. A few areas, generally an acre or less in size, are eroded and have a surface layer of sandy clay loam.

About half the total area of this soil is cultivated. The other half is idle, wooded, or in pasture. Cotton, corn, and soybeans are the chief crops. Coastal bermudagrass and bahiagrass are the main pasture grasses.

Erosion is the chief hazard when cultivating this soil. The slopes are undulating, and it is very difficult to parallel the terraces. To reduce the hazard of erosion, many grassed waterways are needed; and such practices as contour farming, use of close-growing sod crops, and return of crop residue to the surface layer are needed. The fragipan restricts root penetration. Windthrow is a hazard to woodland management (fig. 7). Capability unit IIIe–4; woodland suitability group 3o1.

Vaucluse loamy sand, 6 to 10 percent slopes (VcC).—This sloping or rolling soil is on narrow breaks.

Included with this soil in mapping are small areas of Ailey, Dothan, Faceville, Orangeburg, and Varina soils. Also included are small spots of eroded soil 1 to 3 acres in size and a few gullies 1 to 4 feet deep and 3 to 12 feet wide.

Figure 7.—**Windthrow of planted pines on Vaucluse loamy sand, 2 to 6 percent slopes.**

Most areas of this soil are either wooded or are idle. A few areas are in pasture. Coastal bermudagrass and bahiagrass are the chief pasture grasses.

Erosion is the chief hazard when managing this soil. Terracing, contour farming, growing grass or other plants in waterways, using sod crops frequently in the cropping system, and returning crop residue to the soil help to reduce the hazard of erosion. The fragipan restricts root penetration (fig. 8). Capability unit IVe–4; woodland suitability group 3o1.

Vaucluse soils, 10 to 25 percent slopes (VcD).—These strongly sloping to moderately steep soils are on the breaks near streams or major drainageways. In much of the area the profile of these soils is similar to the one described as representative of the Vaucluse series.

The pattern and extent of Vaucluse and other soils are not uniform in the mapped areas. Vaucluse soils make up 50 to 100 percent of each mapped area. Some of the other soils lack a fragipan but have a subsoil that is 30 to 50 percent brittle material. Others have a fragipan below a sandy surface layer that is 20 to 40 inches thick. Small amounts of Blanton, Fuquay, or Orangeburg soils are included in mapping in places. Also, a few gullies are included in some of the mapped areas.

Most areas of this soil are wooded, but few have been cleared for pasture. Coastal bermudagrass has been planted in places.

Erosion is a severe hazard when managing this soil, and the soil is seldom cultivated. Capability unit VIe–1; woodland suitability group 3o1.

Use and Management of the Soils

The soils of Barnwell County, Eastern Part, are used for row crops, woodland, and pasture. In this section general management of cropland is discussed; the system of land capability classification used by the Soil Conservation Service is described; estimates of yields of the principal crops under a high level of management are given; each soil in capability class I through IV is rated according to its suitability for specified crops; the soils are grouped according to their suitability for use as woodland, and information useful in the management of woodland is provided; and the use of soils for wildlife habitat is discussed. The engineering classification of soils is also discussed in this section, and interpretations are made of the soil characteristics that are significant to engineering and recreational uses of soils.

Figure 8.—**Roots are throughout the upper horizons but cannot penetrate the fragipan (indicated by knife) in Vaucluse loamy sand, 6 to 10 percent slopes.**

This section can be used as a general guide to the management of the soils in the county. For more detailed information about managing the soils, consult the local staff of the Soil Conservation Service, the Clemson University Extension Service, or the Edisto Experiment Station at Blackville, South Carolina.

General Management of Cropland

Most soils in the county require similar general management practices to produce satisfactory yields. These include applying the proper fertilizer, maintaining the organic-matter content of the soil, selecting a good cropping system, tilling the soil properly, and controlling erosion. Some soils also require improved drainage. These basic management practices are discussed in this subsection.

Fertilizer and lime.—Most of the soils in Barnwell County, Eastern Part, are acid and low in natural fertility. Nearly all require regular applications of lime and fertilizer for good crop yields. The kind of fertilizer and the amount of lime and fertilizer to apply is most efficiently determined by a soil test. The local county agricultural agent accepts samples for testing and makes recommendations based on the test results.

Some of the soils of this county leach rapidly, and lime and fertilizers are soon lost for crop use. Among these are Fuquay, Blanton, and Lakeland soils. Lime and fertilizers are more effective on such soils when they are applied frequently but in small amounts.

Fertilization should be the maximum that is consistent with economic returns. The grasses and legumes in pasture in Barnwell County, Eastern Part, require regular applications of nitrogen, phosphorus, and potash for sustained high production, yet these same grasses and legumes will provide erosion control with a minimum of lime and fertilizer.

Organic matter.—Most of the soils in this county are low in organic-matter content. It is not practical in most cases to raise the organic-matter content to what it was when early settlers cleared the land. Efforts should be made to maintain the present level or even increase it over a long period.

Crop residue, cover crops, and cropping sequences that include sod crops are the primary sources of organic matter in Barnwell County, Eastern Part, although some is provided by manure from livestock. Rye is one of the better cover crops in the county, and all the grasses and legumes adapted to the county can be planted as sod in the cropping sequence.

A good cropping system.—A cropping system should be selected that will replenish the organic matter lost from the soil through decomposition. If cover crops and crop residue, especially legumes, are plowed under, yields of the succeeding crops are increased. Good cropping systems help to control erosion, insects, plant diseases, and weeds. The additional organic matter gained through a good cropping system absorbs plant nutrients and releases them to crops over a long period. Without the organic material, fertilizer, especially nitrogen, leaches out if it is not quickly taken up by a growing crop.

The soils of the county are particularly well suited to warm-season plants. More cool-season perennials could be grown, however, to increase the amount of grazing and green manure. In the current cropping systems, small grain or ryegrass is used for winter cover and green-manure crops.

Tillage.—Most of the arable soils in Barnwell County, Eastern Part, can be tilled within a wide range of moisture conditions. Exceptions are such soils as those of the Rembert series and small spots in soils of the Dothan, Faceville, Orangeburg, and Varina series where there is a relatively fine textured surface layer that will puddle, pack, and become cloddy if tilled when wet. Other soils,

especially those of the Clarendon, Dothan, and Fuquay series, develop a compacted restrictive layer called a plowpan or plowsole, if tilled repeatedly at the same depth. Growing sod crops and varying the depth of tillage prevent the formation of a plowpan.

Tillage practices that leave a mulch of crop residue on the surface of the soil have been successful in Barnwell County, Eastern Part. Limited tillage systems are being tested at this time. The system that disturbs the soil the least and returns organic matter to the soil is the one that helps to prevent soil losses by soil blowing and water erosion.

Erosion control.—Soil erosion can be caused by wind or water in Barnwell County, Eastern Part. Large fields of such soils as Dothan, Fuquay, and Varina are especially susceptible to soil blowing when they have been freshly plowed and the surface is dry during spring. Windbreaks, cover crops, wind stripcropping, and tillage systems that leave crop residues on the surface are used to control erosion.

Most soils in Barnwell County, Eastern Part, that have slopes of more than 2 percent and are used as cropland are subject to damage by water erosion. Water erosion can be controlled by water management systems that include diversions, terraces, contour tillage, and grassed waterways. Cropping systems that include cropping sequences and tillage that leaves protective residues on the surface also help control water erosion.

Drainage.—Drainage is essential for good crop production on some soils, such as those of the Clarendon, McColl, and Rembert series (fig. 9).

Drainage ditches and tile drainage systems are used in this county, sometimes in combination. Land smoothing and bedding systems are also used to provide better surface drainage.

Capability Grouping

Some readers, particularly those who farm on a large scale, may find it practical to use and manage alike some of the different kinds of soil on their farm. These readers can make good use of the capability classification system, a grouping that shows, in a general way, the suitability of soils for most kinds of farming.

The grouping is based on limitations of soils when used for field crops, the risk of damage when they are farmed, and the way the soils respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; and does not take into consideration possible but unlikely major reclamation projects.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability

***Figure 9.*—Water covers the surface of Rembert loam much of the time unless drainage is provided by open ditches or tile.**

and limitations of groups of soils for forest trees or for engineering.

In the capability system, all kinds of soil are grouped at three levels—the class, the subclass, and the unit. The eight classes in the capability system are designated by Roman numerals I through VIII. In class I are soils that have few limitations, the widest range of use, and the least risk of damage when intensively used. The soils in the other classes have progressively greater natural limitations. In class VIII the severe limitations preclude their use for commercial crops and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes. In this survey area there are no soils in classes V or VIII.

Capability Subclasses are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example. IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in some parts of the United States but not in this survey area, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

Capability Units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIw–2 and IIIs–1. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

Appropriate management according to capability units is discussed along with the description of each mapping unit in the section "Descriptions of the Soils."

The eight classes in the capability system and the subclasses and units in Barnwell County, Eastern Part, are described in the list that follows. Since all capability units are not represented in Barnwell County, Eastern Part, the numbering of the units is not consecutive.

To determine the capability unit of any soil in the survey area, refer to that soil in the section "Descriptions of the Soils" or in the "Guide to Mapping Units" at the back of this survey.

Class I. Soils having few limitations that restrict their use (no subclasses).
- Unit I–1. Deep, nearly level, well-drained soils that have a loamy subsoil.

Class II. Soils having moderate limitations that reduce the choice of plants or require moderate conservation practices.
- Subclass IIe. Soils subject to moderate erosion unless protected.
  - Unit IIe–1. Deep, gently sloping, well-drained soils that have a loamy subsoil.
  - Unit IIe–2. Deep, gently sloping, well-drained soils that have a clayey subsoil.
  - Unit IIe–5. Deep, gently sloping, well-drained soils that have a loamy subsoil that restricts roots and movement of water.
- Subclass IIw. Soils moderately limited because of excess water.
  - Unit IIw–2. Deep, nearly level, moderately well drained soils that have a loamy subsoil.
  - Unit IIw–5. Deep, nearly level, somewhat poorly drained or moderately well drained soils that have a clayey subsoil.
- Subclass IIs. Soils moderately limited because of low available water capacity, restrictive layers, or both.
  - Units IIs–1. Deep, nearly level to gently sloping, well-drained soils that have a thick sandy surface layer and a loamy subsoil.
  - Unit IIs–2. Deep, nearly level to gently sloping, well-drained soils that have a clayey subsoil that restricts root development.

Class III. Soils having severe limitations that reduce the choice of plants, require special conservation practices, or both.
- Subclass IIIe. Soils subject to severe erosion if they are cultivated and not protected.
  - Unit IIIe–1. Deep, sloping, well-drained soils that have a loamy subsoil.
  - Unit IIIe–2. Deep, sloping, well-drained soils that have a clayey subsoil.
  - Unit IIIe–4. Gently sloping, well-drained soils that are moderately deep to a fragipan which restricts root development.
  - Unit IIIe–5. Deep, sloping, well-drained soils that have a thick sandy surface layer and a loamy subsoil.
- Subclass IIIw. Soils severely limited because of excess water.
  - Unit IIIw–2. Nearly level, poorly drained soils that are shallow or moderately deep to a fragipan or that are deep and have a clayey subsoil.
  - Unit IIIw–4. Nearly level, poorly drained soils that have a loamy subsoil and are moderately deep over sandy underlying material.
- Subclass IIIs. Soils severely limited because of low available water capacity.
  - Unit IIIs–1. Deep, nearly level to gently sloping, droughty soils that have a thick sandy surface layer and a loamy subsoil.

Class IV. Soils having very severe limitations that reduce the choice of plants, require very careful management, or both.
- Subclass IVe. Soils subject to very severe erosion if they are cultivated and not protected.
  - Unit IVe–1. Deep, sloping, droughty soils that have a thick sandy surface layer and a loamy subsoil.

Unit IVe–4. Sloping, well-drained soils that are moderately deep to a fragipan which restricts root development.

Subclass IVw. Soils very severely limited because of excess water.

Unit IVw–3. Deep, nearly level, poorly drained soils that have a thick sandy surface layer and a loamy subsoil.

Subclass IVs. Soils very severely limited because of low available water capacity.

Unit IVs–1. Deep, nearly level to gently sloping, excessively drained droughty soils that are sandy throughout.

Unit IVs–2. Sloping, well-drained soils that are deep to a fragipan which restricts root development.

Class V. Soils that are subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife food and cover.

Subclass Vw. Soils unsuited to cultivation because of excess water.

Unit Vw–1. Poorly drained soils that have a clayey or loamy subsoil and that are not ditched or tile drained.

Class VI. Soils having severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture, woodland, or wildlife food and cover.

Subclass VIe. Soils severely limited, chiefly by risk of erosion, unless protective cover is maintained.

Unit VIe–1. Strongly sloping to moderately steep, well-drained soils that are moderately deep to deep to a fragipan which restricts root development.

Subclass VIs. Soils generally unsuited for cultivation and limited for other uses by their low available water capacity.

Unit VIs–1. Deep, sloping, excessively drained sandy soils that are droughty and unproductive.

Class VII. Soils having very severe limitations that make them unsuited to cultivation and restrict their use largely to woodland or wildlife food and cover.

Subclass VIIw. Soils very severely limited by excess water.

Unit VIIw–3. Nearly level, very poorly drained loamy soils of the stream flood plains that are subject to frequent flooding.

Class VIII. (None in Barnwell County, Eastern Part.) Soils and landforms having limitations that preclude their use for commercial crop production and restrict their use to recreation, wildlife habitat, water supply, or esthetic purposes.

Estimated Yields and Suitability for Crops

Listed in table 2 are the estimated average acre yields of the principal crops grown under a high level of management for the soils in capability classes I through IV of Barnwell County, Eastern Part. The yields are based largely on observations by members of the soil survey party, on information obtained by interviewing farmers and other farm workers who have had experience with the soils and crops of the county, on data accumulated by the Edisto Experiment Station, and on comparison with crop yields obtained from similar soils in other counties in South Carolina.

The practices used in high level management vary according to the soils. The following practices are necessary for high yields:

1. Proper choice and rotation of crops in the cropping system.
2. Correct use of fertilizer, lime, and manure.
3. Correct methods of tillage.
4. Return of organic matter to the soils.
5. Adequate control of water.
6. Maintenance or improvement of workability of the soils.
7. Conservation of soil material, plant nutrients, and soil moisture.

The soils of Barnwell County, Eastern Part, are responsive to good management and fertilization. Higher yields can be obtained from nearly all soils in the county through improved management.

In table 2 the suitability of soils is also rated for selected crops. A rating of 1 indicates that the soil is well suited to the stated crop. Hazards are few, and favorable yields are likely. A rating of 2 indicates that the soil is fairly well suited to the crop, but growth is limited by excessive moisture, too little moisture, low fertility, or some other undesirable characteristic. A rating of 3 indicates that the soil is not well suited to the crop (fig. 10) and that favorable yields are likely to occur only

Figure 10.—Blanton sand, 0 to 6 percent slopes, is not well suited to corn.

TABLE 2.—*Estimated yields and*

[Yields are for soils in capability classes I to IV under a high level of management. Absence of yield figure indicates crop is 4, poorly

Soil	Corn		Cotton (lint)	
	Yields per acre	Suitability	Yields per acre	Suitability
	Bu		*Lbs*	
Ailey sand, 6 to 10 percent slopes	--	4	---	4
Blanton sand, 0 to 6 percent slopes	55	3	---	4
Blanton sand, 6 to 10 percent slopes	50	3	---	4
Clarendon loamy sand	90	1	650	1
Dothan loamy sand, 0 to 2 percent slopes	80	1	750	1
Dothan loamy sand, 2 to 6 percent slopes	75	2	700	1
Dothan loamy sand, 6 to 10 percent slopes	70	2	650	1
Dunbar sandy loam	100	1	660	1
Duplin sandy loam, 0 to 2 percent slopes	100	1	675	1
Faceville loamy sand, 2 to 6 percent slopes	80	1	700	1
Faceville loamy sand, 6 to 10 percent slopes	70	2	600	1
Fuquay sand, 0 to 2 percent slopes	80	1	650	1
Fuquay sand, 2 to 6 percent slopes	75	2	600	1
Fuquay sand, 6 to 10 percent slopes	65	2	550	1
Lakeland sand, 0 to 6 percent slopes	45	3	---	2
Lumbee loamy sand	100	1	---	4
McColl loam	70	2	---	4
Orangeburg loamy sand, 0 to 2 percent slopes	80	1	750	1
Orangeburg loamy sand, 2 to 6 percent slopes	75	2	750	1
Orangeburg loamy sand, 6 to 10 percent slopes	70	2	700	1
Pelham sand	60	2	---	4
Plummer loamy sand	--	4	---	4
Rembert loam	75	2	425	4
Varina loamy sand, 0 to 2 percent slopes	80	1	850	2
Varina loamy sand, 2 to 6 percent slopes	75	2	800	2
Varina loamy sand, 6 to 10 percent slopes	70	2	650	1
Vaucluse loamy sand, 2 to 6 percent slopes	55	3	450	3
Vaucluse loamy sand, 6 to 10 percent slopes	45	4	350	3

when very intensive management is practiced. Generally, this management is not economically feasible. A rating of 4 indicates that the soil is poorly suited to the crop, and attempting to grow the crop on it is usually impractical.

Woodland [3]

Originally Barnwell County, Eastern Part, was mainly wooded. Now trees cover about 60 percent of the survey area.

Good stands of commercial trees are produced in the woodlands of the survey area. Needleleaf forest types occur most frequently on the uplands, and broadleaf types generally predominate on the bottoms along the rivers and creeks.

The value of the wood products is substantial, though it is below its potential. Other values include grazing, wildlife, recreation, natural beauty, and conservation of soil and water. This section has been provided to explain how soils affect tree growth and management in the county. Listed in table 3 are the potential productivity and management problems of the soils in Barnwell County, Eastern Part.

Each woodland suitability group is identified by a three-part symbol. The first part of the symbol indicates the relative productivity of the soils: 1 = very high; 2 = high; 3 = moderately high; 4 = moderate; and 5 = low. The second part of the symbol, a letter, indicates the important soil property that imposes a moderate or severe hazard or limitation in managing the soils for wood crops. The letter *x* shows that the main limitation is stoniness or rockiness; *w* shows that excessive water in or on the soil is the chief limitation; *t* shows that toxic substances in the soil are the chief limitation; *d* shows that the rooting depth is restricted; *c* shows that clay in the upper part of the soil is a limitation; *s* shows the soils are sandy; *f* shows that the soils have large amounts of coarse fragments; *r* shows that the soils have steep slopes; and *o* shows the soils have no significant restrictions or limitations for woodland use or management. The third element in the symbol indicates the degree of management problems and the general suitability of the soils for certain kinds of trees.

The first column at the left in table 3 gives the name and a brief description of the woodland suitability group. Each group is made up of soils that are suited to the same kinds of trees, that need about the same kind of management to produce these trees, and that have about the same potential productivity.

In the second column the soils are listed by their mapping unit symbols under the series name to which they belong.

In the third column is a list of some of the commercially important trees which are suited to the soil. These are the trees which woodland managers will generally favor in intermediate or improved cuttings.

In the fourth column is given the potential productivity of these trees in terms of site index. The site index is the

[3] By GEORGE E. SMITH, JR., woodland conservationist, Soil Conservation Service.

suitability of soils for selected crops

not generally grown on that soil. The suitability rating of 1 indicates well suited; 2, fairly well suited; 3, not well suited; and suited]

Peanuts		Soybeans		Coastal bermudagrass for hay		Bahiagrass for hay	
Yields per acre	Suitability	Yields per acre	Suitability	Yields per acre	Suitability	Yields per acre	Suitability
Lbs		*Bu*		*Tons*		*Tons*	
----	4	--	4	3.0	2	2.5	3
1,800	2	--	4	3.5	2	3.5	2
1,600	2	--	4	3.5	2	3.0	2
----	4	35	1	5.0	1	5.0	1
2,500	1	40	1	6.0	1	4.0	1
2,300	1	35	1	6.0	1	4.0	1
2,000	2	30	2	5.5	1	3.5	2
----	4	40	1	5.5	1	4.5	1
----	4	45	1	5.5	1	4.5	1
2,000	1	40	1	6.0	1	4.0	1
1,500	2	35	1	6.0	1	4.0	1
2,500	1	30	2	5.5	1	3.5	2
2,300	1	25	2	5.5	1	3.5	2
2,000	1	15	3	5.0	1	3.0	2
1,500	2	15	3	4.5	2	3.0	2
----	4	40	1	--	4	2.5	3
----	4	25	2	--	4	--	4
2,500	1	40	1	6.0	1	5.0	1
2,300	1	40	1	6.0	1	5.0	1
2,200	1	30	2	6.0	1	5.0	1
----	4	25	2	2.0	3	4.0	1
----	4	--	4	--	4	2.5	3
----	4	35	1	--	4	5.5	1
1,900	2	40	1	5.0	1	5.0	1
1,850	2	35	1	5.0	1	5.0	1
1,700	2	30	2	5.0	1	4.0	1
----	4	20	3	5.0	1	4.5	1
----	4	15	3	4.0	2	4.0	1

TABLE 3.—*Woodland suitability groups of soils and factors for wood crops*

Woodland suitability group and description	Soil series and map symbols	Productivity		Species suitable for planting
		Tree species	Site index	
1w9 Excessively wet soils with very high potential productivity; severe equipment restrictions and seedling mortality in areas where surface drainage is inadequate; suitable for needle-leaved or broad-leaved trees or a combination of both.	Johnston: JO.	Slash pine[1] ----------	100	Loblolly pine,[2] slash pine,[2] sweetgum,[2] sycamore,[2] water tupelo, Shumard oak.
		Loblolly pine[1] --------	100	
		Water oak[1] ----------	90	
		Tupelos ----------	---	
		Pond pine ----------	80	
2o1 Soils with high potential productivity; no serious management problems; best suited to needle-leaved trees.	Dothan: DaA, DaB, DaC; Orangeburg: OrA, OrB, OrC.	Loblolly pine ----------	90	Slash pine, loblolly pine.
		Slash pine ----------	90	
		Longleaf pine ---------	70	
2w3 Excessively wet soils with high potential productivity; severe equipment limitations and seedling mortality where surface drainage is inadequate; best suited to needle-leaved trees.	Pelham: Pe; Plummer: Pu.	Loblolly pine[1] --------	90	Slash pine,[2] loblolly pine.[2]
		Slash pine[1] ----------	90	
		Longleaf pine[1] --------	70	
2w8 Seasonally wet soils with high potential productivity; moderate equipment restrictions and slight to moderate seedling mortality; suitable for needle-leaved or broad-leaved trees.	Clarendon: Cd; Dunbar: Db; Duplin: DpA.	Loblolly pine ----------	90	Loblolly pine,[2] slash pine,[2] yellow-poplar,[2] sycamore,[2] sweetgum.[2]
		Slash pine ----------	90	
		Sweetgum ----------	90	
		Yellow-poplar ---------	100	
		Water oak ----------	90	
		Tupelos ----------	---	
		Red oak ----------	---	
		White oak ----------	---	

TABLE 3.—*Woodland suitability groups of soils and factors for wood crops*—Continued

Woodland suitability group and description	Soil series and map symbols	Productivity		Species suitable for planting
		Tree species	Site index	
2w9 Excessively wet soils with high potential productivity; severe equipment restrictions and seedling mortality on areas without adequate surface drainage; suitable for broad-leaved or needle-leaved trees.	Lumbee: Lu; McColl: Mc; Rembert: Re.	Loblolly pine [1] Slash pine [1] Tupelos Cypress Sweetgum [1] Green ash Red oak White oak	90 90 --- --- 90 --- --- ---	Loblolly pine, slash pine,[2] sweetgum,[2] sycamore,[2] water tupelo, Shumard oak, water oak.[2]
3o1 Soils with moderately high productivity; no serious management problem; best suited to needle-leaved trees.	Faceville: FaB, FaC; Varina: VaA, VaB, VaC; Vaucluse: VcB, VcC, VcD.	Loblolly pine Slash pine Longleaf pine	--- 80 60–70	Loblolly pine, slash pine.
3s2 Sandy soils with moderately high productivity; moderate equipment restrictions and seedling mortality; best suited to needle-leaved trees.	Blanton: BaB, BaC; Fuquay: FuA, FuB, FuC.	Slash pine Loblolly pine Longleaf pine	80 80 60–70	Slash pine, longleaf pine.
4s2 Sandy soils with moderate productivity; moderate equipment restrictions and seedling mortality; best suited to needle-leaved trees.	Ailey: AeC, AeD; Lakeland: LaB, LaC.	Slash pine Loblolly pine Longleaf pine	70 70 60	Longleaf pine, sand pine, slash pine.

[1] Potential productivity attainable on areas with adequate surface drainage.
[2] Tree planting is feasible only on areas with adequate surface drainage.

average height of dominant trees, in feet to the nearest 10 feet, at age 30 for cottonwood; at age 35 for sycamore; and at age 50 for all other species or types.

In the fifth column is a list of trees suitable to plant for commercial wood production.

The management concerns of equipment limitations and seedling mortality are evaluated in the brief description of the woodland suitability groups given in column 1 of table 3.

Equipment limitation ratings reflect the soil conditions that restrict the use of equipment generally used in woodland management or harvesting. *Slight* ratings indicate equipment use is not limited to kind or time of year. A rating of *moderate* indicates a seasonal limitation or need for modification in methods or equipment. *Severe* limitations indicate the need for specialized equipment or operations.

Seedling mortality ratings indicate the degree of expected mortality of planted seedlings when plant competition is not a limiting factor. Normal rainfall, good planting stock, and proper planting are assumed. A *slight* rating indicates expected mortality is less than 25 percent; *moderate* indicates a 25 to 50 percent expected mortality loss; and *severe* indicates an expected mortality loss of more than 50 percent.

Woodland yields

Data on growth and yields of unmanaged stands are not a true measure of potential productivity of stands that are managed, but such information permits a comparison of productivity between sites or between species on the same site. Also, by comparing potential yields of wood crops and potential yields of other crops on a site, one can decide the use of land that best meets the objectives.

The average annual growth for natural unmanaged stands by site indexes at 50 years and more (*5*, *8*) are shown in figures 11 and 12, and the merchantable volumes for loblolly pine plantations by site indexes at 25 years (*4*) are shown in figure 13.

Wildlife [4]

Soils directly influence kinds and amounts of vegetation and amounts of water available, and in this way they indirectly influence the kinds of wildlife that can live in an area. Soil properties that affect wildlife habitat are:

1. Thickness of soil useful to crops.
2. Surface layer texture.
3. Available water capacity to a depth of 40 inches.
4. Wetness.
5. Surface layer stoniness or rockiness.
6. Hazard of flooding.
7. Slope.
8. Permeability of the soil to air and water.

In table 4 soils of this survey area are rated for producing six elements of wildlife habitat and for three groups, or kinds, of wildlife. The ratings indicate relative suitability for various elements. A rating of good means the element of wildlife habitat, and habitats generally, are easily created, improved, and maintained. Few or no limitations affect management in this category, and satisfactory results are expected when the soil is used for the prescribed purpose.

A rating of fair means the element of wildlife habitat, and habitats generally, can be created, improved, or main-

[4] By WILLIAM W. NEELY, biologist, Soil Conservation Service.

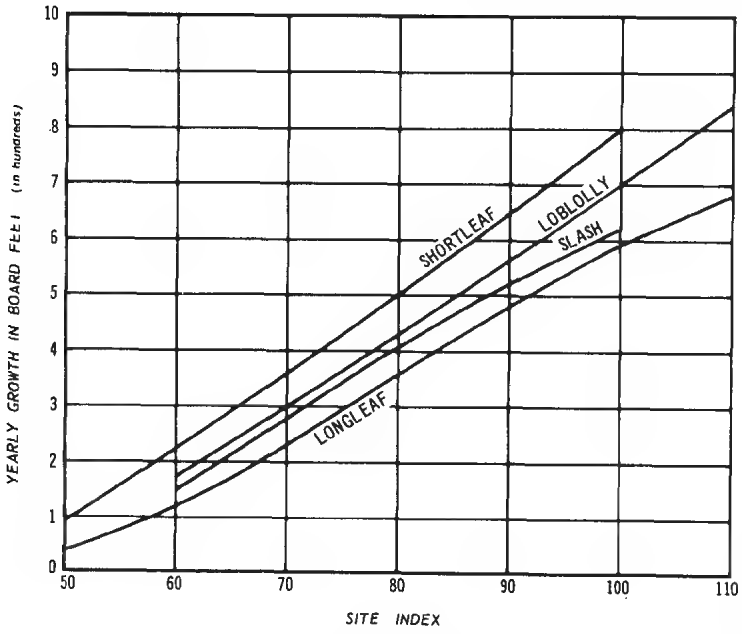

***Figure 11.*—Average yearly growth per acre in board feet for 50-year-old, well-stocked stands of southern pines. (Scribner log rule, all stems 8 inches or larger in diameter.)**

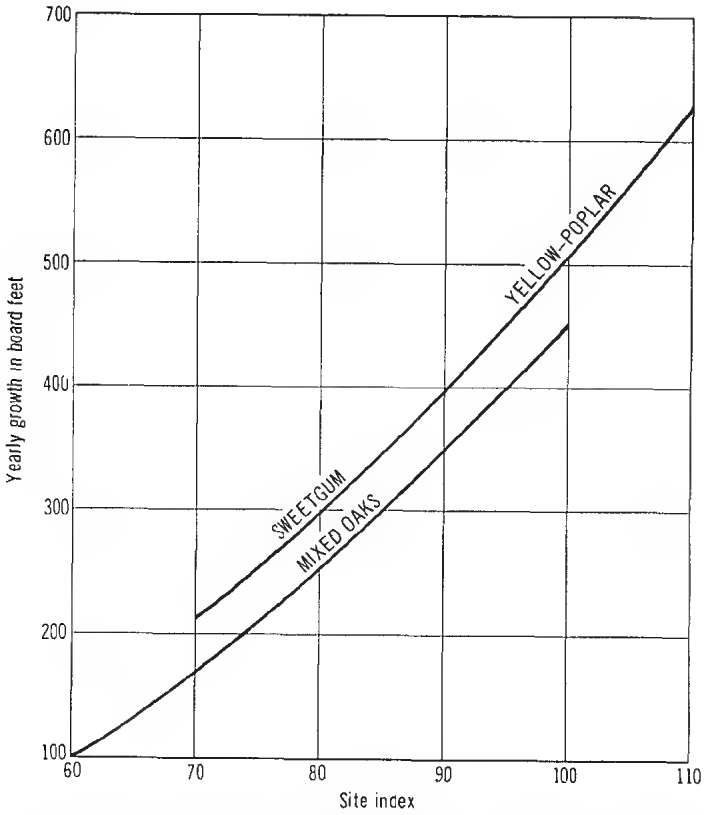

***Figure 12.*—Average yearly growth per acre in board feet for well-stocked, even-aged southern hardwood stands to age 60. (Scribner log rule.)**

tained in most places. Moderate intensity of management and fairly frequent attention may be required, however, for satisfactory results.

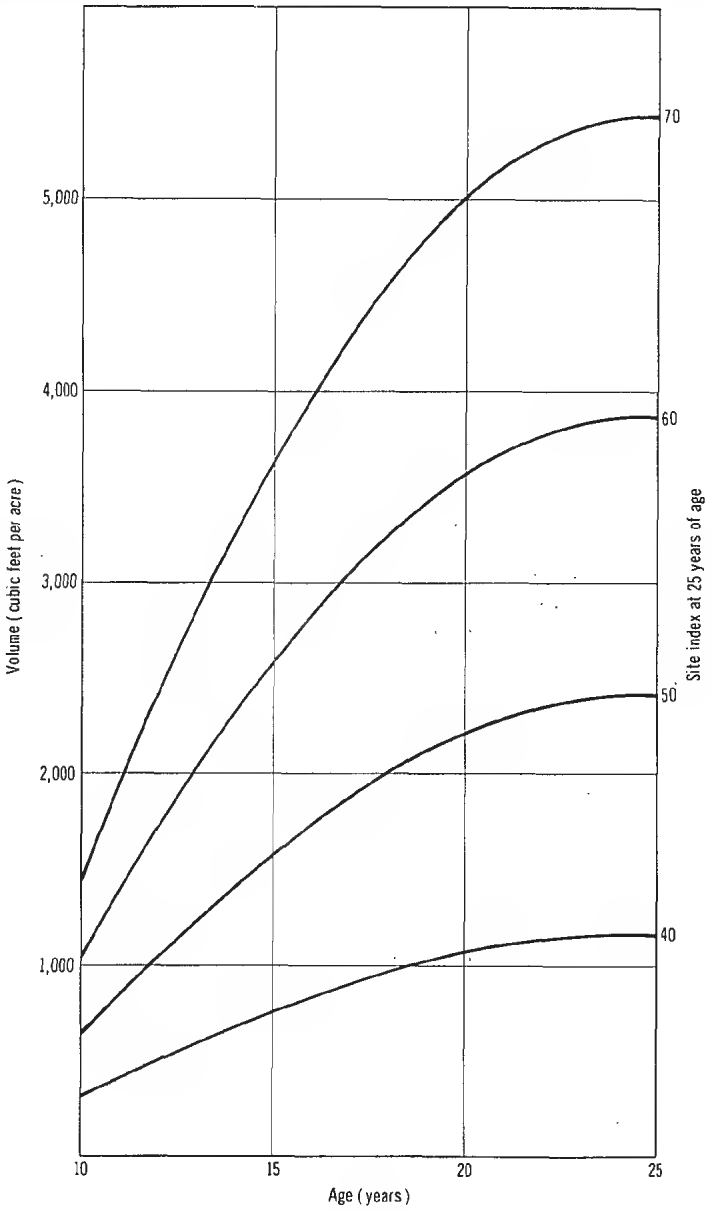

***Figure 13.*—Volume of merchantable wood (inside bark) to a 3-inch top in cubic feet per acre for loblolly pine plantations. Stocking: 700 trees per acre.**

A rating of poor means the soil limitations for this element of wildlife habitat and limitations for the designated use are rather severe. Habitats can be created, improved, or maintained in most places, but management is difficult and requires intensive effort.

A rating of very poor means that the soil limitations for the elements of wildlife habitat are very severe and that unsatisfactory results are to be expected. It is either impossible or impractical to create, improve, or maintain habitats on soils in this category.

The significance of each subheading in table 4 under "Elements of Wildlife Habitat" and "Kinds of Wildlife" is given in the following paragraphs.

Elements of wildlife habitat.—Each soil is rated in table 4 according to its suitability for producing various kinds of plants and other elements that make up wildlife habitats. The ratings take into account mainly the characteristics of the soils and closely related natural factors of the environment. They do not take into account climate, present use of soils, or present distribution of wildlife and people. For this reason, selection of a site for development as a habitat for wildlife requires inspection at the site.

Grain and seed crops.—These crops are annual grain-producing plants, such as corn, sorghum, millet, and soybeans.

Grasses and legumes.—Making up the group are domestic grasses and legumes that are established by planting. They provide food and cover for wildlife. Grasses include bahiagrass, ryegrass, and panicgrass; legumes include annual lespedeza, shrub lespedeza, and clovers.

Wild herbaceous plants.—This group consists of native or introduced perennial grasses, forbs, and weeds that provide food and cover for upland wildlife. Beggarweed, perennial lespedeza, wild bean, pokeweed, and cheatgrass are typical examples. Typical range plants are bluestem, grama, perennial forbs, and legumes.

Hardwood trees, shrubs, and vines.—These plants are nonconiferous trees, shrubs, and woody vines that produce wildlife food in the form of fruits, nuts, buds, catkins, or browse. Such plants commonly grow in their natural environment, but they may be planted and developed through wildlife management programs. Typical species in this category are oak, beech, cherry, dogwood, maple, viburnum, grape, honeysuckle, greenbrier, and silverberry.

Wetland food and cover plants.—In this group are annual and perennial herbaceous plants that grow wild on moist and wet sites. They furnish food and cover mostly for wetland wildlife. Typical examples of plants are smartweed, wild millet, spikerush and other rushes, sedges, burreed, tearthumb, and aneilema. Submersed and floating aquatics are not included in this category.

Shallow-water developments.—These developments are impoundments or excavations for controlling water, generally not more than 5 feet deep, to create habitats that are suitable for waterfowl. Some are designed to be drained, planted, and then flooded; others are permanent impoundments that grow submersed aquatics.

Kinds of wildlife.—In table 4 soils are rated according to their suitability as habitat for the three kinds of wildlife in the county—open-land, woodland, and wetland. These ratings are related to ratings made for the elements of habitat. For example, soils rated very poor for shallow-water developments are rated very poor for wetland wildlife.

Open-land wildlife are birds and mammals that normally live in meadows, pastures, and open areas where grasses, herbs, and shrubby plants grow. Quail, doves, meadowlarks, field sparrows, cottontail rabbits, and foxes are typical examples of open-land wildlife.

Woodland wildlife are birds and mammals that normally live in wooded areas of hardwood trees, coniferous trees, and shrubs. Woodcocks, thrushes, wild turkeys, vireos, deer, squirrels, and raccoons are typical examples of woodland wildlife.

Wetland wildlife are birds and mammals that normally live in wet areas, marshes, and swamps. Ducks, geese, rails, shore birds, herons, minks, and muskrats are typical examples of wetland wildlife.

Engineering Uses of the Soils [5]

This section is useful to those who need information about soils used as structural material or as foundation upon which structures are built. Among those who can benefit from this section are planning commissions, town and city managers, land developers, engineers, contractors, and farmers.

Among properties of soils highly important in engineering are permeability, strength, compaction characteristics, soil drainage condition, shrink-swell potential, grain size, plasticity, and soil reaction. Also important are depth to the water table and soil slope. These properties, in various degrees and combinations, affect construction and maintenance of roads, airports, pipelines, foundations for small buildings, irrigation systems, ponds and small dams, and systems for disposal of sewage and refuse.

Information in this section of the soil survey can be helpful to those who—

1. Select potential residential, industrial, commercial, and recreational areas.
2. Evaluate alternate routes for roads, highways, pipelines, and underground cables.
3. Seek sources of gravel, sand, or clay.
4. Plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for controlling water and conserving soil.
5. Correlate performance of structures already built with properties of the kinds of soil on which they are built to predict performance of structures on the same or similar kinds of soil in other locations.
6. Predict the trafficability of soils for cross-country movement of vehicles and construction equipment.
7. Develop preliminary estimates pertinent to construction in a particular area.

Most of the information in this section is presented in tables 5 to 12, which show, respectively, several estimated soil properties significant to engineering; interpretations for various engineering uses; and results of engineering laboratory tests on soil samples.

This information, along with the soil map and other parts of this publication, can be used to make interpretations in addition to those given in tables 5 to 12. It also can be used to make other useful maps.

This information, however, does not eliminate need for further investigations at sites selected for engineering works, especially works that involve heavy loads or that require excavations to depths greater than those shown in the tables, generally depths greater than 6 feet. Also, inspection of sites, especially the small ones, is needed because many delineated areas of a given soil mapping unit may contain small areas of other kinds of soil that have strongly contrasting properties and different suitabilities or limitations for soil engineering.

Some of the terms used in this soil survey have special meanings to soil scientists that are not known to all engineers. The Glossary defines many of these terms commonly used in soil science.

[5] ROBERT E. THOMPSON, engineer, Soil Conservation Service, assisted in preparation of this section.

TABLE 4.—*Suitability of soils for elements of wildlife habitat and kinds of wildlife*

Soil	Elements of wildlife habitat						Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees, shrubs, and vines	Wetland food and cover plants	Shallow-water developments	Open-land	Wood-land	Wet-land
Ailey sand, 6 to 10 percent slopes.	Poor	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Ailey sand, 10 to 15 percent slopes.	Very poor.	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Blanton sand, 0 to 6 percent slopes.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Blanton sand, 6 to 10 percent slopes.	Poor	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Clarendon loamy sand.	Good	Good	Good	Good	Very poor.	Poor	Good	Good	Poor.
Dothan loamy sand, 0 to 2 percent slopes.	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Dothan loamy sand, 2 to 6 percent slopes.	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Dothan loamy sand, 6 to 10 percent slopes.	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Dunbar sandy loam	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
Duplin sandy loam, 0 to 2 percent slopes.	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
Faceville loamy sand, 2 to 6 percent slopes.	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Faceville loamy sand, 6 to 10 percent slopes.	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Fuquay sand, 0 to 2 percent slopes.	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Fuquay sand, 2 to 6 percent slopes.	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Fuquay sand, 6 to 10 percent slopes.	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Johnston soils	Very poor.	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Fair	Fair.
Lakeland sand, 0 to 6 percent slopes.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Lakeland sand, 6 to 10 percent slopes.	Very poor.	Poor	Poor	Fair	Very poor.	Very poor.	Very poor.	Fair	Very poor.
Lumbee loamy sand	Poor	Poor	Poor	Good	Fair	Fair	Poor	Good	Fair.
McColl loam	Very poor.	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Fair	Fair.
Orangeburg loamy sand, 0 to 2 percent slopes.	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Orangeburg loamy sand, 2 to 6 percent slopes.	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Orangeburg loamy sand, 6 to 10 percent slopes.	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Pelham sand	Very poor.	Very poor.	Poor	Good	Fair	Fair	Very poor.	Fair	Fair.
Plummer loamy sand	Very poor.	Very poor.	Poor	Good	Fair	Fair	Very poor.	Good	Fair.
Rembert loam	Very poor.	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Fair	Fair.
Varina loamy sand, 0 to 2 percent slopes.	Good	Good	Good	Good	Very poor.	Poor	Good	Good	Poor.
Varina loamy sand, 2 to 6 percent slopes.	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Varina loamy sand, 6 to 10 percent slopes.	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Vaucluse loamy sand, 2 to 6 percent slopes.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Vaucluse loamy sand, 6 to 10 percent slopes.	Very poor.	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Vaucluse soils, 10 to 25 percent slopes.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.

TABLE 5.—*Classification and*

Soil series and map symbols	Depth	USDA texture
	In	
Ailey: AeC, AeD.	0–30	Sand
	30–41	Sandy clay loam
	41–64	Sandy clay loam
Blanton: BaB, BaC.	0–60	Sand
	60–95	Sandy loam, sandy clay loam
Clarendon: Cd.	0–7	Loamy sand
	7–13	Sandy loam
	13–30	Sandy clay loam
	30–72	Sandy clay loam
Dothan: DaA, DaB, DaC.	0–11	Loamy sand
	11–33	Sandy clay loam
	33–70	Sandy clay loam
Dunbar: Db.	0–7	Sandy loam
	7–60	Clay
Duplin: DpA.	0–8	Sandy loam
	8–72	Sandy clay, clay
Faceville: FaB, FaC.	0–7	Loamy sand
	7–72	Sandy clay
Fuquay: FuA, FuB, FuC.	0–22	Sand
	22–34	Sandy loam
	34–80	Sandy clay loam
Johnston: JO.	0–38	Mucky loam
	38–60	Sandy loam
Lakeland: LaB, LaC.	0–68	Sand
	68–86	Sand
Lumbee: Lu.	0–8	Loamy sand
	8–36	Sandy clay loam
	36–60	Loamy sand
McColl: Mc.	0–8	Loam
	8–20	Clay
	20–60	Sandy clay, clay
Orangeburg: OrA, OrB, OrC.	0–10	Loamy sand
	10–72	Sandy clay loam
Pelham: Pe.	0–36	Sand
	36–72	Sandy clay loam
Plummer: Pu.	0–50	Loamy sand, sand
	50–65	Sandy loam
Rembert: Re.	0–5	Loam
	5–33	Clay
	33–50	Sandy clay loam
Varina: VaA, VaB, VaC.	0–8	Loamy sand
	8–30	Sandy clay
	30–72	Sandy clay
Vaucluse: VcB, VcC, VcD.	0–6	Loamy sand
	6–19	Sandy clay loam, sandy loam
	19–80	Sandy loam, sandy clay loam

estimated physical properties

Classification		Percentage passing sieve—		
Unified	AASHTO	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.072 mm)
SM, SP–SM	A–2	80–100	50–75	10–20
SC, SM	A–2, A–4	80–100	60–85	30–40
SC, SM	A–2	80–100	55–80	20–35
SM, SP–SM	A–2, A–3	100	70–90	5–20
SC, SM	A–4, A–2	95–100	80–90	30–45
SM	A–2	95–100	65–85	15–25
SM	A–2	95–100	70–85	20–30
SC	A–4	95–100	75–90	36–45
SC	A–4, A–2	95–100	75–90	30–45
SM	A–2	95–100	65–90	14–35
SM–SC, SC	A–2, A–4, A–6	95–100	65–90	30–40
SM–SC, SC	A–2, A–4, A–6	95–100	75–92	30–49
SM	A–4, A–2	100	70–85	30–45
CH, CL, ML	A–7, A–6	100	80–95	55–70
SM	A–2, A–4	100	70–90	25–40
CL, CH	A–6, A–7	100	85–100	55–71
SM, SM-SC	A–2	95–100	65–85	20–35
CL, SC, ML	A–6, A–7	95–100	75–95	45–70
SP-SM, SM	A–2, A–3	100	50–80	5–20
SM, SC	A–2, A–4	100	65–80	20–40
SC, CL	A–6, A–4, A–2	100	80–90	30–55
OL	----------	100	85–95	40–60
SM-SC, SM	A–4, A–2	100	70–85	30–50
SP-SM	A–3	100	70–80	5–10
SP	A–3	100	70–80	1–5
SM	A–2	85–100	65–90	15–35
SC, SM–SC	A–2, A–4, A–6	90–100	65–95	36–50
SM	A–2	85–100	65–95	15–25
SM, SC	A–2, A–6	95–100	75–90	25–50
SC, ML, CL	A–4, A–7	95–100	80–98	36–75
CL–ML, SC, CL	A–2, A–6	95–100	65–90	32–55
SM	A–2	95–100	70–90	15–35
CL, SC	A–6, A–4	95–100	80–95	36–55
SP–SM, SM	A–2, A–3	95–100	75–100	5–20
CL, SC	A–4	100	85–100	40–65
SP–SM, SM	A–2	100	80–100	10–20
SM	A–2	100	65–100	20–35
SC, CL	A–4, A–6	100	70–90	45–70
CL	A–7	100	85–95	65–80
SM, SC	A–2, A–4	100	50–70	30–40
SM	A–2	100	80–90	15–35
SC, CL	A–6, A–7	100	85–95	45–70
SC, SM, CL	A–4, A–6, A–7	100	85–95	45–70
SP–SM, SM	A–2, A–3	100	51–70	8–20
SM, SC	A–2, A–4	95–100	50–70	25–49
SM	A–2, A–4	95–100	50–70	20–40

TABLE 6.—*Estimated physical*

Soil series and map symbols	Depth	Permeability	Available water capacity
	Inches	*Inches per hour*	*Inches per inch of soil*
Ailey: AeC, AeD.	0–30	6.0–20	0.03–0.05
	30–41	0.6–2.0	0.09–0.12
	41–64	0.06–0.2	0.08–0.10
Blanton: BaB, BaC.	0–60	6.0–2.0	0.06–0.08
	60–95	0.6–2.0	0.12–0.17
Clarendon: Cd.	0–7	2.0–6.0	0.09–0.12
	7–13	2.0–6.0	0.10–0.12
	13–30	0.6–2.0	0.10–0.14
	30–72	0.2–0.6	0.08–0.12
Dothan: DaA, DaB, DaC.	0–11	2.0–6.0	0.08–0.11
	11–33	0.6–2.0	0.10–0.14
	33–70	0.2–0.6	0.12–0.16
Dunbar: Db.	0–7	2.0–6.0	0.10–0.14
	7–60	0.2–0.6	0.13–0.15
Duplin: DpA.	0–8	2.0–6.0	0.12–0.14
	8–72	0.2–0.6	0.14–0.16
Faceville: FaB, FaC.	0–7	2.0–6.0	0.06–0.10
	7–72	0.6–2.0	0.12–0.15
Fuquay: FuA, FuB, FuC.	0–22	6.0–20	0.02–0.08
	22–34	2.0–6.0	0.10–0.12
	34–80	0.06–0.2	0.10–0.12
Johnston: JO.	0–38	0.6–2.0	0.15–0.20
	38–60	2.0–6.0	0.10–0.14
Lakeland: LaB, LaC.	0–68	6.0–20	0.02–0.05
	68–86	6.0–20	0.02–0.05
Lumbee: Lu.	0–8	2.0–6.0	0.03–0.12
	8–40	0.6–2.0	0.10–0.14
	40–60	2.0–6.0	0.04–0.08
McColl: Mc.	0–8	0.6–2.0	0.12–0.16
	8–20	0.2–0.6	0.13–0.17
	20–60	0.06–0.2	0.05–0.09
Orangeburg: OrA, OrB, OrC.	0–10	2.0–6.0	0.06–0.08
	10–72	0.6–2.0	0.10–0.13
Pelham: Pe.	0–36	6.0–20	0.05–0.08
	36–72	0.6–2.0	0.10–0.12
Plummer: Pu.	0–50	2.0–6.0	0.03–0.08
	50–65	0.6–2.0	0.10–0.13
Rembert: Re.	0–5	0.6–2.0	0.15–0.20
	5–33	0.06–0.2	0.12–0.16
	33–50	0.6–2.0	0.12–0.17
Varina: VaA, VaB, VaC.	0–8	2.0–6.0	0.08–0.13
	8–30	0.6–2.0	0.12–0.16
	30–72	0.06–0.2	0.08–0.12
Vaucluse: VcB, VcC, VcD.	0–6	6.0–20	0.04–0.06
	6–19	0.6–2.0	0.10–0.14
	19–80	0.06–0.2	0.05–0.08

and chemical characteristics

Soil reaction	Shrink-swell potential	Risk of corrosion	
		Uncoated steel	Concrete
pH			
4.5–6.0	Low	Moderate: acidity, texture	Moderate, texture, acidity.
4.5–5.5	Low		
4.5–5.5	Low		
4.5–5.5	Low	Low	Moderate: acidity.
4.5–5.5	Low		
4.5–5.5	Low	Moderate: texture, drainage	Moderate: acidity, texture.
4.5–5.5	Low		
4.5–5.5	Low		
4.5–5.5	Low		
4.5–5.5	Low	Moderate: texture, drainage	Moderate: texture, acidity.
4.5–5.5	Low		
4.5–5.5	Low		
4.5–5.5	Low	High: drainage, texture	High: acidity.
4.5–5.5	Moderate		
4.5–5.5	Low	High: wetness, texture	High: texture, acidity.
4.5–5.5	Moderate		
4.5–5.5	Low	Moderate: acidity	Moderate: acidity.
4.5–5.5	Moderate		
4.5–5.5	Low	Low	High: texture, acidity.
4.5–5.5	Low		
4.5–5.5	Low		
4.5–5.5	Low	Moderate: drainage	High: texture, acidity.
4.5–5.5	Low		
4.5–5.5	Low	Low	Moderate to high: texture, acidity.
4.5–5.5	Low		
4.5–5.5	Low	High: drainage, texture	Moderate to high: texture, acidity.
4.5–5.5	Low		
4.5–5.5	Low		
4.5–5.5	Low	High: poorly drained, acidity	Moderate to high: texture, acidity.
4.5–5.5	Low		
4.5–5.5	Low		
4.5–5.5	Low	Moderate: acidity	Moderate: acidity, texture.
4.5–5.5	Low		
4.5–5.5	Low	Moderate: acidity, wetness	Moderate: acidity, texture.
4.5–5.5	Low		
3.6–5.5	Low	High: acidity, high water table.	High: poorly drained with coarse texture and fluctuating water table.
3.6–5.5	Low		
4.5–5.5	Low	High: poorly drained, fine texture, acidity.	High: texture, acidity.
4.5–5.5	Moderate		
4.5–5.5	Low		
5.0–6.5	Low	Moderate: texture, acidity	Moderate: texture, acidity.
4.5–5.5	Low		
4.5–5.5	Low		
4.5–5.5	Low	Low	High: texture, acidity.
3.6–5.5	Low		
3.6–5.5	Low		

TABLE 7.—*Community development*

[Soil characteristics in this table are expressed in computer-adapted terms differing from those in the Soil Survey Manual (9). Refer to the Glossary for definition of "low strength" and other terms that describe soil characteristics]

Soil series and map symbols	Dwellings	Small commercial buildings	Highways and streets
Ailey: AeC, AeD	Moderate: slope	Moderate if slope is 6 to 10 percent, severe if slope is 10 to 15 percent.	Moderate: slope.
Blanton: BaB, BaC	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.
Clarendon: Cd	Moderate: wetness	Moderate: wetness	Moderate: low strength.
Dothan: DaA, DaB, DaC	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.	Moderate: low strength.
Dunbar: Db	Severe: wetness	Severe: wetness	Severe: low strength, wetness, shrink-swell.
Duplin: DpA	Moderate: wetness, shrink-swell.	Moderate: wetness, shrink-swell	Moderate to severe: low strength, shrink-swell, wetness.
Faceville: FaB, FaC	Slight if slope is 2 to 6 percent, moderate if slope is 6 to 10 percent.	Slight if slope is 2 to 6 percent, moderate if slope is 6 to 10 percent.	Moderate: low strength, shrink-swell.
Fuquay: FuA, FuB, FuC	Moderate: low strength	Moderate: low strength	Moderate: low strength.
Johnston: JO	Severe: floods, wetness	Severe: floods, wetness	Severe: floods, wetness.
Lakeland: LaB, LaC	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent; low strength.	Moderate if slope is 0 to 6 percent, low strength; severe if slope is 6 to 10 percent.	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.
Lumbee: Lu	Severe: wetness, floods	Severe: wetness, floods	Severe: wetness, floods.
McColl: Mc	Severe: floods, wetness	Severe: floods, wetness	Severe: floods, wetness.
Orangeburg: OrA, OrB, OrC	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.
Pelham: Pe	Severe: wetness	Severe: wetness	Severe: wetness.
Plummer: Pu	Severe: floods, wetness	Severe: floods, wetness	Severe: floods, wetness.
Rembert: Re	Severe: floods, wetness	Severe: floods, wetness	Severe: floods, wetness.
Varina: VaA, VaB, VaC	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.
Vaucluse: VcB, VcC, VcD	Slight if slope is 2 to 6 percent, moderate if slope is 6 to 10 percent, severe if slope is 10 to 25 percent.	Slight if slope is 2 to 6 percent, moderate if slope is 6 to 10 percent, severe if slope is 10 to 25 percent.	Slight if slope is 2 to 6 percent, moderate if slope is 6 to 10 percent, severe if slope is 10 to 25 percent.

Engineering soil classification systems

The two systems most commonly used in classifying samples of soils for engineering are the Unified system by the SCS engineers, Department of Defense, and others, and the AASHTO system adopted by the American Association of State Highway Officials.

In the Unified system soils are classified according to particle-size distribution, plasticity, liquid limit, and organic matter. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes; for example, CL-ML.

The AASHTO system is used to classify soils according to those properties that affect use in highway construction and maintenance. In this system a soil is placed in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. In group A-1 are gravelly soils of high bearing strength, or the best soils for subgrade (foundation). At the other extreme, in group A-7, are clay soils that have low strength when wet and that are the poorest soils for subgrade. Where laboratory data are available to justify a further breakdown, the A-1, A-2, and A-7 groups are divided as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As additional refinement, the engineering value of a soil material can be indicated by a group index number. Group indexes range from 0 for

TABLE 8.—*Sanitary facilities*

[Soil characteristics in this table are expressed in computer-adapted terms differing from those in the Soil Survey Manual (9). Refer to the Glossary for definition of "percs slowly" and other terms that describe soil characteristics]

Soil series and map symbols	Septic-tank absorption fields	Sewage lagoons	Sanitary landfill (trench)
Ailey: AeC, AeD	Severe: cemented pan	Severe: slope	Slight.
Blanton: BaB, BaC	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.	Severe: percs rapidly	Slight.
Clarendon: Cd	Severe: wetness	Severe: wetness [1]	Severe: wetness.
Dothan: DaA, DaB, DaC	Moderate: percs slowly	Slight if slope is 0 to 2 percent, moderate if slope is 2 to 6 percent, severe if slope is 6 to 10 percent.	Slight.
Dunbar: Db	Severe: wetness	Severe: wetness	Severe: wetness.
Duplin: DpA	Severe: wetness	Severe: wetness [1]	Severe: wetness.
Faceville: FaB, FaC	Slight if slope is 2 to 6 percent, moderate if slope is 6 to 10 percent.	Moderate if slope is 2 to 6 percent: seepage. Severe if slope is 6 to 10 percent.	Moderate: too clayey.
Fuquay: FuA, FuB, FuC	Moderate: percs slowly	Moderate: seepage	Slight.
Johnston: JO	Severe: floods, wetness	Severe: floods, wetness	Severe: floods, wetness.
Lakeland: LaB, LaC	Slight if slope is 0 to 6 percent moderate if slope is 6 to 10 percent.[2]	Severe: seepage	Severe: too sandy.[3]
Lumbee: Lu	Severe: wetness	Severe: wetness	Severe: wetness.
McColl: Mc	Severe: wetness	Severe: wetness [1]	Severe: wetness.
Orangeburg: OrA, OrB, OrC	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.	Moderate if slope is 0 to 6 percent: seepage. Severe if slope is 6 to 10 percent.	Slight.
Pelham: Pe	Severe: wetness	Severe: wetness	Severe: wetness.
Plummer: Pu	Severe: wetness	Severe: wetness	Severe: wetness.
Rembert: Re	Severe: wetness	Severe: wetness [1]	Severe: wetness.
Varina: VaA, VaB, VaC	Severe: percs slowly	Slight if slope is 0 to 2 percent, moderate if slope is 2 to 6 percent, severe if slope is 6 to 10 percent.	Moderate: too clayey.
Vaucluse: VcB, VcC, VcD	Severe: percs slowly	Moderate if slope is 2 to 6 percent, severe if slope is 6 to 25 percent.	Slight if slope is 2 to 15 percent, moderate if slope is 15 to 25 percent.

[1] Slight where floor of lagoon is nearly impermeable and at least 2 feet thick.
[2] Onsite investigations of the underlying strata, water tables, and hazards of aquifer pollution and drainage into ground water need to be made for these sandy soils.
[3] Slight where underlying material has permeability of less than 2.0 inches per hour.

the best material to 20 or more for the poorest. The AASHTO classification for tested soils, with group index numbers in parentheses, is shown in table 12; the estimated classification, without group index numbers, is given in table 5 for all soils mapped in the survey area.

USDA texture is determined by the relative proportions of sand, silt, and clay in soil material that is less than 2.0 millimeters in diameter. "Sand," "silt," "clay," and some of the other terms used in the USDA textural classification are defined in the Glossary.

Soil properties significant to engineering

Several estimated soil properties significant in engineering are given in tables 5 to 12. These estimates are made for typical soil profiles, by layers sufficiently different to have different significance for soil engineering. The estimates are based on field observations made in the course of mapping, on test data for these and similar soils, and on experience with the same kinds of soil in other counties. In the following paragraphs are explanations of some of the terms used in the tables.

Soil texture is listed in table 5 in the standard terms used by the Department of Agriculture. These terms take into account relative percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the soil contains gravel or other particles coarser

TABLE 9.—*Hydrologic features*

[The symbol > means more than]

Soil series and map symbols	Water on surface		Depth to water table
	Frequency	Duration	
		Months	*Feet*
Ailey: AeC, AeD	None	None	>6
Blanton: BaB, BaC	None	None	>6
Clarendon: Cd	None	None	1.5–2.5
Dothan: DaA, DaB, DaC.	None	None	>6
Dunbar: Db	Occasional	0–0.5	0–1.5
Duplin: DpA	None	None	2.5
Faceville: FaB, FaC	None	None	>6
Fuquay: FuA, FuB, FuC.	None	None	>6
Johnston: JO	Very frequent	10–12	0–1
Lakeland: LaB, LaC	None	None	>6
Lumbee: Lu	Frequent	2–6	0–1
McColl: Mc	Frequent	2–6	0–2
Orangeburg: OrA, OrB, OrC.	None	None	>6
Pelham: Pe	Occasional	1–2	1–4
Plummer: Pu	Frequent	6–11	0–1.5
Rembert: Re	Frequent	6–10	0–1
Varina: VaA, VaB, VaC.	None	None	>6
Vaucluse: VcB, VcC, VcD.	None	None	>6

than sand, an appropriate modifier is added, as for example, "gravelly loamy sand."

Bedrock is more than 10 feet below the surface for all soils in this survey area.

Permeability in table 6 is that quality of a soil that enables it to transmit water or air. It is estimated on the basis of those soil characteristics observed in the field, particularly structure and texture. The estimates in table 6 do not take into account lateral seepage or such transient soil features as plowpans and surface crusts.

Available water capacity is the ability of soils to hold water for use by most plants. It is commonly defined as the difference between the amount of water in the soil at field capacity and the amount at the wilting point of most crop plants.

Reaction is the degree of acidity or alkalinity of a soil, expressed in pH values. The pH value and terms used to describe soil reaction are explained in the Glossary.

Shrink-swell potential is the relative change in volume to be expected of soil material with changes in moisture content; that is, the extent to which the soil shrinks as it dries out or swells when it gets wet. Extent of shrinking and swelling is influenced by the amount and kind of clay in the soil. Shrinking and swelling of soils causes much damage to building foundations, roads, and other structures. A *high* shrink-swell potential indicates a hazard to maintenance of structures built in, on, or with material having this rating.

Risk of corrosion in table 6 pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. Risk of corrosion of uncoated steel is related to such soil properties as drainage, texture, total acidity, and electrical conductivity of the soil material. Corrosivity for concrete is influenced mainly by the content of sodium or magnesium sulfate, but it is also

TABLE 10.—*Source material*

[Soil characteristics in this table are expressed in computer-adapted terms differing from those in the Soil Survey Manual (*9*). Refer to the Glossary for definition of "area reclaim" and other terms that describe soil characteristics]

Soil series and map symbols	Road fill	Sand	Topsoil
Ailey: AeC, AeD	Good	Poor	Poor: too sandy.
Blanton: BaB, BaC	Good	Poor	Poor: too sandy.
Clarendon: Cd	Good	Poor	Fair: thin layer, wetness.
Dothan: DaA, DaB, DaC	Good	Poor	Fair: thin layer.
Dunbar: Db	Poor: shrink-swell, wetness	Poor	Poor: thin layer, wetness.
Dupin: DpA	Poor: low strength, shrink-swell	Poor	Fair: thin layer, wetness.
Faceville: FaB, FaC	Fair: shrink-swell	Poor	Fair: thin layer.
Fuquay: FuA, FuB, FuC	Good	Fair	Poor: too sandy.
Johnston: JO	Poor: wetness, excess humus	Poor	Poor: wetness.
Lakeland: LaB, LaC	Good	Good	Poor: too sandy.
Lumbee: Lu	Poor: wetness	Poor	Poor: wetness.
McColl: Mc	Poor: wetness	Poor	Fair: too clayey.
Orangeburg: OrA, OrB, OrC	Good	Poor	Fair: area reclaim.
Pelham: Pe	Fair: wetness	Fair	Poor: too sandy, wetness.
Plummer: Pu	Poor: wetness	Poor	Poor: too sandy, wetness.
Rembert: Re	Poor: wetness	Poor	Poor: wetness, too thin.
Varina: VaA, VaB, VaC	Good	Poor	Fair: too thin, area reclaim.
Vaucluse: VcB, VcC, VcD	Fair: low strength	Poor	Poor: too sandy, area reclaim.

TABLE 11.—*Water management*

[Soil characteristics in this table are expressed in computer-adapted terms differing from those in the Soil Survey Manual (*9*). Refer to the Glossary for definition of "cutbanks cave" and other terms that describe soil characteristics]

Soil series and map symbols	Limitations for—			Features affecting—			
	Pond reservoir areas	Embankments and dikes	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ailey: AeC, AeD	Slight	Miderate piping	Severe: no water.	Well drained.	Seepage, droughty.	Erodes easily.	Droughty, erodes easily.
Blanton: BaB, BaC	Severe: seepage.	Moderate: piping. seepage.	Severe: no water.	Well drained.	Seepage, droughty.	Erodes easily.	Droughty, erodes easily.
Clarendon: Cd	Moderate: seepage.	Moderate: piping. hard to pack.	Severe: deep to water.	Floods, wetness.	Wetness	Nearly level.	Floods, wetness.
Dothan: DaA, DaB, DaC	Moderate: seepage.	Slight	Severe: no water.	Well drained.	Slope	Erodes easily.	Erodes easily.
Dunbar: Db	Moderate: seepage.	Moderate: compressible.	Moderate: deep to water.	Percs slowly.	Wetness	Nearly level.	Wetness.
Duplin: DpA	Moderate: seepage.	Slight to moderate: compressible	Moderate: deep to water.	Percs slowly.	Wetness	Nearly level.	Wetness.
Faceville: FaB, FaC	Moderate: seepage.	Slight	Severe: no water.	Well drained.	Slope	Erodes easily.	Erodes easily.
Fuquay: FuA, FuB, FuC	Slight	Moderate: piping.	Severe: no water.	Well drained.	Seepage, droughty.	Complex slopes, erodes easily.	Droughty, erodes easily.
Johnston: JO	Moderate: seepage.	Severe: piping.	Slight	Floods, poor outlet, wetness.	Wetness	Nearly level.	Wetness.
Lakeland: LaB, LaC	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Excessively drained.	Droughty, seepage.	Nearly level.	Droughty, erodes easily.
Lumbee: Lu	Severe: seepage.	Moderate: seepage.	Moderate: deep to water.	Cutbanks cave, wetness.	Wetness	Nearly level.	Wetness.
McColl: Mc	Slight	Moderate: piping, unstable fill.	Severe: deep to water.	Cemented pan, wetness.	Wetness	Nearly level.	Wetness.
Orangeburg: OrA, OrB, OrC.	Moderate: seepage, deep to water.	Slight	Severe: no water.	Well drained.	Slope	Erodes easily.	Erodes easily.
Pelham: Pe	Severe: seepage.	Severe: seepage.	Severe: deep to water.	Cutbanks cave.	Droughty	Nearly level.	Droughty.
Plummer: Pu	Moderate: seepage.	Moderate: piping.	Severe: deep to water.	Cutbanks cave, floods, wetness.	Wetness	Nearly level.	Wetness.
Rembert: Re	Moderate: seepage.	Moderate: unstable fill.	Moderate: deep to water.	Percs slowly, floods, wetness.	Slow intake, wetness.	Nearly level.	Wetness.
Varina: VaA, VaB, VaC	Moderate: percs moderately.	Slight	Severe: no water.	Well drained.	Slope	Erodes easily.	Erodes easily.
Vaucluse: VcB, VcC, VcD	Slight	Moderate: unstable fill, piping.	Severe: no water.	Well drained.	Rooting depth, droughty, slope.	Erodes easily.	Erodes easily, droughty.

TABLE 12.—*Engineering test data*

[Tests performed by the South Carolina Highway Department in cooperation with the U.S. Department of Commerce, Bureau of Public Roads, according to standard procedures of the American Association of State Highway [and Transportation] Officials (AASHTO) (*1*)]

Soil name and location	Report No.	Depth	Mechanical analysis [1]			Liquid limit	Plasticity index	Classification	
			Percentage passing sieve—						
			No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)			AASHTO [2]	Unified [3]
	S67SC-6	*Inches*							
Dothan loamy sand:	9-1	0-6	100	88	20	--	(4)	A-2-4(0)	SM
1 mile west-southwest of Blackville and 1,400 yards west-southwest of dam on Edisto Experiment Station. (Modal)	9-3	14-22	100	88	37	23	9	A-4(0)	SC
	9-4	22-40	100	91	45	36	17	A-6(4)	SC
Dunbar sandy loam:	10-1	0-7	100	83	38	17	3	A-4(1)	SM
2 miles southwest of Blackville and 1 mile south of U.S. Highway 78. (Modal)	10-2	7-21	100	91	59	39	21	A-6(9)	CL
	10-3	21-45	100	93	71	46	17	A-7-6(11)	ML
Duplin sandy loam:	12-1	0-8	100	89	35	15	1	A-2-4(0)	SM
3½ miles southwest of Blackville, 1 mile west of State Park, and 10 yards north of dirt road. (Modal)	12-2	8-25	100	92	63	38	18	A-6(9)	CL
	12-5	40-72	100	90	71	53	25	A-7-6(15)	CH
Faceville loamy sand:	14-1	0-6	100	86	29	17	5	A-2-4(0)	SC-SM
1¾ miles southeast of Barnwell and 200 feet east of Southern Railroad in cultivated field. (Nonmodal, firm subsoil)	14-2	6-21	100	89	55	36	14	A-6(6)	CL
	14-4	26-39	100	90	56	41	15	A-7-6(6)	ML
Faceville loamy sand:	13-1	0-7	[5]98	81	24	--	(4)	A-2-4(0)	SM
2½ miles west of Blackville and 660 yards southwest of dam on Edisto Experiment Station. (Modal)	13-2	7-30	100	86	51	36	16	A-6(5)	CL
	13-3	30-50	[5]97	80	58	44	18	A-7-6(9)	ML
Fuquay sand:	1-1	0-8	100	75	12	--	(4)	A-2-4(0)	SP-SM
1½ miles southeast of Barnwell and 200 feet east of Southern Railroad. (Nonmodal, thick A horizon)	1-2	8-38	100	77	18	--	(4)	A-2-4(0)	SM
	1-4	41-53	100	82	35	27	14	A-2-6(1)	SC
Fuquay sand:	2-1	0-8	100	81	11	--	(4)	A-2-4(0)	SP-SM
3½ miles southwest of Blackville and 2 miles south of Edisto Experiment Station and 1½ miles west of Barnwell State Park. (Modal)	2-3	28-36	100	84	23	--	(4)	A-2-4(0)	SM
	2-5	42-53	100	83	36	28	8	A-4(0)	SC
Fuquay sand:	3-1	0-9	100	76	9	--	(4)	A-3(0)	SP-SM
4 miles northwest of Blackville and 200 yards north of U.S. Highway 78. (Nonmodal, thin A horizon)	3-2	9-13	100	76	14	--	(4)	A-2-4(0)	SM
	3-4	22-41	100	61	31	22	6	A-2-4(0)	SC-SM
	3-5	41-50	100	83	39	30	14	A-6(2)	SC
McColl loam:	4-1	0-8	100	86	29	18	5	A-2-4(0)	SC-SM
660 yards southwest of Headquarters, Edisto Experiment Station and 200 yards east of Shrub Branch Church.	4-3	9-16	100	85	39	25	9	A-4(1)	SC
	4-4	16-23	100	89	51	37	14	A-6(4)	CL
Varina loamy sand:	16-1	0-10	100	81	20	--	(4)	A-2-4(0)	SM
2 miles west of Blackville and 600 yards south of U.S. Highway 78. (Nonmodal, thick A horizon)	16-3	12-26	100	87	45	29	12	A-6(3)	SC
	16-4	26-62	100	87	44	35	11	A-6(2)	SC

See footnotes at end of table.

TABLE 12.—*Engineering test data*—Continued

Soil name and location	Report No.	Depth	Mechanical analysis[1]			Liquid limit	Plasticity index	Classification	
			Percentage passing sieve—					AASHTO[2]	Unified[3]
			No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)				
Varina loamy sand: Edisto Experiment Station, 165 yards northeast of Creek at dam built in 1964 and 100 feet northwest of dirt road. (Nonmodal, gray mottles at a depth of 33 inches)	17–1	0–9	100	79	19	--	(4)	A–2–4(0)	SM
	17–3	16–33	100	84	45	34	17	A–6(4)	SC
	17–4	33–65	100	91	64	48	26	A–7–6(13)	CL
Varina loamy sand: 2 miles northeast of Hilda and 175 yards north of S.C. Highway 70. (Modal)	18–1	0–3	100	88	28	--	(4)	A–2–4(0)	SM
	18–2	3–26	100	87	46	31	13	A–6(3)	SC
	18–4	35–49	100	84	48	42	14	A–7–6(4)	SM
	18–5	49–74	100	89	38	28	8	A–4(1)	SC

[1] Mechanical analysis according to AASHTO Designation: T 88–57 (*1*). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHTO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analysis data used in this table are not suitable for naming textural classes for soils.

[2] Based on standard specifications of highway material and methods of sampling and testing (pt. 1, Ed. 8): AASHTO Designation M145–49 (*1*).

[3] Based on the Unified Soil Classification System (*2*).

[4] Nonplastic.

[5] The percentage greater than the No. 10 (2 mm) passes the 1½-inch sieve.

influenced by soil texture and acidity. Installations of uncoated steel that intersect soil boundaries or soil horizons are more susceptible to corrosion than installations entirely in one kind of soil or in one soil horizon. A corrosivity rating of *low* means that there is a low probability of soil-induced corrosion damage. A rating of *high* means that there is a high probability of damage, so that protective measures for steel and more resistant concrete should be used to avoid or minimize damage.

Engineering interpretations

The estimated interpretations in tables 7 to 11 are based on the engineering properties of soils shown in tables 5 and 6, on test data for soils in this survey area (table 12) and others nearby or adjoining, and on the experience of engineers and soil scientists with the soils of Barnwell County, Eastern Part. In tables 7, 8, and 10, ratings are used to summarize limitation or suitability of the soils for all listed purposes other than for drainage of cropland and pasture, irrigation, ponds and reservoirs, embankments, and terraces and diversions. For these particular uses, table 11 lists those soil features not to be overlooked in planning, installation, and maintenance.

Soil limitations are indicated by the ratings slight, moderate, and severe. *Slight* means soil properties are generally favorable for the rated use, or, in other words, limitations are minor and easily overcome. *Moderate* means that some soil properties are unfavorable, but these can be overcome or modified by special planning and design. *Severe* means soil properties are so unfavorable and so difficult to correct or overcome that major soil reclamation, special design, or intensive maintenance are required.

Soil suitability is rated by the terms *good*, *fair*, and *poor*, which have, respectively, meanings approximately parallel to the terms slight, moderate, and severe.

Dwellings, as rated in table 7, are not more than three stories high and are supported by foundation footings placed in undisturbed soil. The features that affect the rating of a soil for dwellings are those that relate to capacity to support load and resist settlement under load, and those that relate to ease of excavation. Soil properties that affect capacity to support load are wetness, susceptibility to flooding, density, plasticity, texture, and shrink-swell potential. Those that affect excavation are wetness, slope, depth to bedrock, and content of stones and rocks.

Small commercial buildings in table 7 refers to sites for buildings of three stories or less. It is assumed that facilities for sewage disposal are available. The factors considered in rating the limitations are slope, wetness, flooding, shrink-swell potential, and relative load-bearing strength based on the Unified classification. Ratings are for undisturbed soil that is used to support foundations of light industrial buildings.

Highways and streets, as rated in table 7, have an all-weather surface expected to carry automobile traffic all year. They have a subgrade of underlying soil material; a base consisting of gravel, crushed rock, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. These roads are graded to shed water and have ordinary provisions for drainage. They are built mainly from soil at hand, and most cuts and fills are less than 6 feet deep.

Soil properties that most affect design and construction of roads (fig. 14) and streets are load supporting capacity

Figure 14.—Erosion of fill material caused failure of this road on Dothan loamy sand, 2 to 6 percent slopes.

and stability of the subgrade, and the workability and quantity of cut and fill material available. The AASHTO and Unified classifications of the soil material, and also the shrink-swell potential, indicate traffic-supporting capacity. Wetness and flooding affect stability of the material. Slope, depth to hard rock, content of stones and rocks, and wetness affect ease of excavation and amount of cut and fill needed to reach an even grade.

Explanations of the columns in table 8 are given in the following paragraphs.

Septic-tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into natural soil. The soil material from a depth of 18 inches to 6 feet is evaluated. The soil properties considered are those that affect both absorption of effluent and construction and operation of the system. Properties that affect absorption are permeability, depth to water table or rock, and susceptibility to flooding. Slope is a soil property that affects difficulty of layout and construction and also the risk of soil erosion, lateral seepage, and downslope flow of effluent. Large rocks or boulders increase construction costs but are not a problem in this survey area.

Sewage lagoons are shallow ponds constructed to hold sewage within a depth of 2 to 5 feet long enough for bacteria to decompose the solids. A lagoon has a nearly level floor and sides, or embankments, of compacted soil material. The assumption is made that the embankment is compacted to medium density and the pond is protected from flooding. Properties are considered that affect the pond floor and the embankment. Those that affect the pond floor are permeability, organic matter, and slope. If the floor needs to be leveled, depth to bedrock also becomes important. The soil properties that affect the embankment are the engineering properties of the embankment material as interpreted from the Unified Soil Classification and the amounts of stones, if any, that influence the ease of excavation and compaction of the embankment material.

Sanitary landfill is a method of disposing of refuse in dug trenches (fig. 15). The waste is spread in thin layers, compacted, and then covered with soil throughout the disposal period. Landfill areas are subject to heavy vehicular traffic. Some soil properties that affect suitability for landfill are ease of excavation, hazard of polluting ground water, and trafficability. The best soils have moderately slow permeability, withstand heavy traffic, and are friable and easy to excavate. Unless otherwise stated the ratings in table 8 apply only to a depth of about 6 feet, and therefore limitation ratings of *slight* or *moderate* may not be valid if trenches are to be much deeper than that. For some soils, reliable predictions can be made to a depth of 10 or 15 feet; but regardless of that, every site should be investigated before it is selected.

Road fill, in table 10, is soil material used in embankments for roads. The suitability ratings given in the table reflect the predicted performance of soil after it has been placed in an embankment that has been properly compacted and provided with adequate drainage and the relative ease of excavating the material at borrow areas.

Sand is used in great quantities in many kinds of construction. The ratings in table 10 provide guidance about where to look for probable sources. A soil rated as a *good* or *fair* source of sand generally has a layer at least 3 feet thick, the top of which is within a depth of 6 feet. The ratings do not take into account thickness of overburden, location of the water table, or other factors that affect mining of the materials. Also, they do not indicate quality of the deposit. Sources of gravel are unknown in this survey area.

Topsoil is used for topdressing an area where vegetation is to be established and maintained. Suitability is affected mainly by ease of working and spreading the soil

Figure 15.—**This area of Lakeland sand, 6 to 10 percent slopes, has soil material at the bottom of the trench that is moderate in permeability.**

material, as for preparing a seedbed; natural fertility of the material, or its response of plants when fertilizer is applied; and absence of substances toxic to plants. Texture of the soil material and its content of stone fragments are characteristics that affect suitability, but also considered in the ratings is damage that will result at the area from which topsoil is taken.

Pond reservoir areas, as rated in table 11, hold water behind a dam or embankment. Soils suitable for pond reservoir areas have low seepage, which is related to their permeability and depth to fractured or permeable bedrock or other permeable material.

Embankments and dikes require soil material resistant to seepage and piping and of favorable stability, shrink-swell potential, shear strength, and compactibility. Presence of stones and content of organic matter in a soil are among factors that are unfavorable.

Excavated ponds are dug ponds on nearly level soils. They depend on a spring or high water table to recharge the water supply. Ratings are based on year-round average conditions.

Drainage of cropland and pasture is affected by such soil properties as permeability, texture, and structure; depth to claypan, rock, or other layers that influence rate of water movement; depth to the water table; slope and stability in ditchbanks; susceptibility to stream overflow; salinity or alkalinity; and availability of outlets for drainage.

Irrigation of a soil is affected by such features as slope; susceptibility to stream overflow, water erosion, or soil

blowing; texture; content of stones; accumulations of salts and alkali; depth of root zone; rate of water intake at the surface; permeability of soil layers below the surface layer and in fragipans or other layers that restrict movement of water; amount of water held available to plants; and need for drainage, or depth to water table or bedrock.

Terraces and diversions are embankments or ridges constructed across the slope to intercept runoff and allow it to soak into the soil or flow slowly to a prepared outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock or other unfavorable material; presence of stones; permeability; and resistance to water erosion, soil slipping, and soil blowing. A soil suitable for these structures provides outlets for runoff and is not difficult to vegetate.

Grassed waterways are affected by severity of erosion, droughtiness, and natural drainage.

Soil test data

Table 12 contains engineering test data for some of the major soil series in Barnwell County, Eastern Part. These tests were made to help evaluate the soils for engineering purposes. The engineering classifications given are based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits. The mechanical analyses were made by combined sieve and hydrometer methods.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material changes from the semisolid to plastic state, and the liquid limit is the moisture content at which it changes from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic.

Recreational Development

Knowledge of soils is necessary in planning, developing, and maintaining areas used for recreation. In table 13 the soils of Barnwell County, Eastern Part, are rated according to limitations that affect their suitability for camp areas, playgrounds, picnic areas, paths and trails, and golf fairways.

In table 13 the soils are rated as having slight, moderate, or severe limitations for the specified uses. For all of these ratings, it is assumed that a good cover of vegetation can be established and maintained. A limitation of *slight* means that soil properties are generally favorable and limitations are so minor that they easily can be overcome. A *moderate* limitation can be overcome or modified by planning, by design, or by special maintenance. A *severe* limitation means that costly soil reclamation, special design, intense maintenance, or a combination of these, is required.

Camp areas are used intensively for tents and small camp trailers and the accompanying activities of outdoor living. Little preparation of the site is required, other than shaping and leveling for tent and parking areas. Camp areas are subject to heavy foot traffic and limited vehicular traffic. The best soils have mild slopes, good drainage, a surface free of rocks and coarse fragments, freedom from flooding during periods of heavy use, and a surface that is firm after rains but not dusty when dry.

Playgrounds are areas used intensively for baseball, football, badminton, and similar organized games. Soils suitable for this use need to be able to withstand intensive foot traffic. The best soils have a nearly level surface free of coarse fragments and rock outcrops, good drainage, freedom from flooding during periods of heavy use, and a surface that is firm after rains but not dusty when dry. If grading and leveling are required, depth to rock is important.

Picnic areas are attractive natural or landscaped tracts used primarily for preparing meals and eating outdoors. These areas are subject to heavy foot traffic. Most of the vehicular traffic, however, is confined to access roads. The best soils are firm when wet but not dusty when dry. They are free of flooding during the season of use, and they do not have slopes or characteristics of stoniness that greatly increase cost of leveling sites or of building access roads.

Paths and trails are used for local and cross-country travel by foot or horseback. Design and layout should require little or no cutting and filling. The best soils are at least moderately well drained, are firm when wet but not dusty when dry, are flooded not more than once during the season of use, have slopes of less than 15 percent, and have few or no rocks or stones on the surface.

Golf fairways receive intensive traffic, and features such as wetness, slope, thick sandy surface, and risk of flooding are considered.

Formation and Classification of the Soils

This section tells how the factors of soil formation affected the development of soils in Barnwell County, Eastern Part. It explains the current system of soil classification and classifies each soil series in the survey area according to this system.

Factors of Soil Formation

Soil is the product of the interaction of five soil-forming processes acting collectively on accumulated or deposited material. The five soil forming factors are parent material, climate, living organisms (plants and animals), relief, and time. In extreme cases one of these factors may determine the main properties of a soil. For example, Lakeland soils formed in almost pure quartz sand and, except for a little organic residue in the surface layer, they show little change as a result of the soil-forming process. Climate and living organisms are the active forces of soil formation. The extent of the influence is determined by the other three factors.

The soil-forming process is complex. To bring about a clearer understanding of this process, the five factors are discussed separately in the following paragraphs.

TABLE 13.—*Recreational development*

[Soil characteristics in this table are expressed in computer-adapted terms differing from those in the Soil Survey Manual. Refer to the Glossary for definition of "percs slowly" and other terms that describe soil characteristics]

Soil series and map symbols	Camp areas	Playgrounds	Picnic areas	Paths and trails	Golf fairways
Ailey: AeC, AeD	Moderate: too sandy, slope.	Severe: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Moderate: too sandy, slope.
Blanton: BaB, BaC	Moderate: too sandy.	Severe: too sandy.	Moderate: too sandy.	Severe: too sandy.	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.
Clarendon: Cd	Moderate: wetness.	Moderate: wetness.	Slight	Slight	Moderate: wetness.
Dothan: DaA, DaB, DaC	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.	Slight if slope is 0 to 2 percent, moderate if slope is 2 to 6 percent, severe if slope is 6 to 10 percent.	Slight	Slight	Slight.
Dunbar: Db	Moderate if slope is 6 to 10 percent, wetness, percs slowly.	Severe: wetness	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Duplin: DpA	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight	Moderate: wetness.
Faceville: FaB, FaC	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.	Moderate if slope is 2 to 6 percent, severe if slope is 6 to 10 percent.	Slight	Slight	Slight.
Fuquay: FuA, FuB, FuC	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.
Johnston: JO	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
Lakeland: LaB, LaC	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
Lumbee: Lu	Severe: wetness	Severe: wetness, floods.	Severe: wetness.	Severe: wetness.	Severe: wetness, floods.
McColl: Mc	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, floods.
Orangeburg: OrA, OrB, OrC	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.	Moderate: slope, too sandy; severe if slope is 6 to 10 percent.	Slight	Slight	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.
Pelham: Pe	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: too sandy.	Moderate: wetness, too sandy.
Plummer: Pu	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
Rembert: Re	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
Varina: VaA, VaB, VaC	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.	Slight if slope is 0 to 2 percent, moderate if slope is 2 to 6 percent, severe if slope is 6 to 10 percent.	Slight	Slight	Slight if slope is 0 to 6 percent, moderate if slope is 6 to 10 percent.
Vaucluse: VcB, VcC, VcD	Moderate: percs slowly; severe if slope is 10 to 25 percent.	Moderate: percs slowly; severe if slope is 6 to 25 percent.	Moderate: too sandy; severe if slope is 10 to 25 percent.	Moderate: too sandy.	Moderate: percs slowly, slope, too sandy; severe if slope is 10 to 25 percent.

Parent material

Parent material is the unconsolidated mass from which a soil forms. This material controls the texture and mineralogy of most of the soils that are formed from it. In Barnwell County, Eastern Part, the parent material is beds or strata of sandy to clayey Coastal Plain sediment. It has been deposited by the Atlantic Ocean and streams during the Cretaceous to Quaternary geological age (*3*).

Climate

Climate is important in the formation of soils. The climate of Barnwell County, Eastern Part, is mild and temperate, with rainfall distributed fairly evenly throughout the year. Information on temperature and precipitation can be found under the heading "Climate" in the section "Additional Facts About the County."

Climate, particularly precipitation and temperature, affect the physical, chemical, and biological relationships in the soil. Water dissolves minerals, leaches plant nutrients, increases chemical and biological activity, and transports the dissolved mineral and organic matter through the soil material in the profile. A long frost-free season and heavy rainfall result in the downward movement of fine-textured soil material and the loss of valuable plant nutrients.

The amount of water that percolates through the soil depends on the amount of rainfall, the relative humidity, and the length of the frost-free season. Percolation, or the downward movement of water, also is affected by relief, or lay of the land, and by permeability of the soil material. A high average temperature increases the number and kinds of living organisms in the soil.

Relief

Relief, or topography, influences soil formation because of its effect on soil drainage, erosion, and soil temperature.

In Barnwell County, Eastern Part, slopes range from 0 to 25 percent. The slopes are cut by the drainageways or streams, and some slopes are undulating. Erosion is evident on any exposed soil on slopes of over 2 or 3 percent. Soil blowing is active on exposed ridgetops.

Bottoms and nearly level soils are influenced by soil drainage and by water table height and duration. The poorly drained soils lack oxidation and develop gray and low-chroma colors. The soils on hills and ridges develop colors of higher chroma. An increase in organic-matter content occurs where the soil is saturated with water for extended periods that are followed by a season dry enough to grow a grass sod crop. This additional organic matter, in turn, influences the plant and animal life.

Living organisms

Plant and animal life in and on the soil has helped to develop the soil, and it continues to alter parent material and influences the present characteristics of most soils. Plants add organic matter and nitrogen to the soil. Some plants can take nitrogen from the atmosphere and, through decay of the plant (aided by organisms), add the nitrogen to the soil. Products of plant decomposition are an active force in the oxidation-reduction reactions which alter the iron and aluminum minerals in the soil parent material.

Bacteria, fungi, and other micro-organisms are indispensable in soil formation. Larger plants alter the soil microclimate, furnish organic matter, and transfer chemical elements from the subsoil to the surface layer.

Most of the fungi, bacteria, and other micro-organisms in the soils of Barnwell County, Eastern Part, are in the upper few inches of the soil. The activity of earthworms and other small invertebrates is chiefly in the upper 6 inches. Crayfish are common in the poorly drained soils and tunnel to depths of 4 feet or more.

The larger animals play an important part in soil formation. Foxes, rats, and other animals make burrows, mix soil horizons; and alter soil formation. The greatest effect, however, is made by man, who clears the land of the native vegetation to plant and produce selected crops. Man affects soil forming by draining swamps, improving drainage, leveling soils, controlling floods, irrigating, compacting soils, increasing runoff, introducing new crops, cultivating crops, and applying fertilizer, lime, and other chemicals.

Man has changed the native vegetation on the upland from a forest of oak, hickory, and pine to either all pines or cleared fields. The poorly drained bottoms that were once birch, gum, cypress, and yellow-poplar are now sweetgum, elm, willow oak, water oak, pines, and a few cypress.

Time

Thousands of years are required for nature to develop a mature soil. The surface layer may be developed in a few hundred years or less, but the illuvial subsoil takes much longer to develop. Most of the soils in Barnwell County, Eastern Part, have an illuvial subsoil and are therefore old soils.

Time is an important step in the formation of a soil profile. It takes time for organic matter to accumulate, for leaching of carbonates and salts, for translocation of silicate clay minerals, and for the reduction and transfer of iron believed to be a step in development of plinthite.

Classification of the Soils

Classification consists of an orderly grouping of soils according to a system designed to make it easier to remember soil characteristics and interrelationships. Classification is useful in organizing and applying the results of experience and research. Soils are placed in narrow classes for discussion in detailed soil surveys and for application of knowledge within farms and fields. The many thousands of narrow classes are then grouped into progressively fewer and broader classes in succcessively higher categories, so that information can be applied to large geographic areas.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 and revised later. The system currently used by the National Cooperative Soil Survey was developed in the early 1960's and adopted in 1965. It is under continual study (*6, 10*).

The current system of classification has six categories. Beginning with the most inclusive, these categories are the order, the suborder, the great group, the subgroup, the family, and the series. The criteria for classification are

soil properties that are observable or measurable, but the properties are selected so that soils of similar genesis are grouped together. The placement of some soil series in the current system of classification, particularly in families, may change as more precise information becomes available.

Table 14 shows the classification of each soil series of Barnwell County, Eastern Part, by family, subgroup, and order, according to the current system. The categories of the current system are briefly described in the following paragraphs.

ORDER. Ten soil orders are recognized. The properties used to differentiate among soil orders are those that tend to give broad climatic groupings of soils. The two exceptions to this are the Entisols and Histosols, which occur in many different climates. Each order is named with a word of three or four syllables ending *sol* (Ent-i-sol).

SUBORDER. Each order is subdivided into suborders that are based primarily on those soil characteristics that seem to produce classes with the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders are mainly those that reflect either the presence or absence of waterlogging, or soil differences resulting from the climate or vegetation. The names of suborders have two syllables. The last syllable indicates the order. An example is Aquult (*Aqu*, meaning water or wet, and *ult*, from Ultisols).

GREAT GROUP. Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus have accumulated; those that have pans that interfere with growth of roots, movement of water, or both; and thick, dark-colored surface horizons. The features used are the self-mulching properties of clay, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), dark-red and dark-brown colors associated with basic rocks, and the like. The names of great groups have three or four syllables and are made by adding a prefix to the name of the suborder. An example is Ochraquults (*Ochr*, meaning light-colored horizons, *aqu* for wetness or water, and *ult*, from Ultisols).

SUBGROUP. Great groups are subdivided into subgroups, one representing the central (typic) segment of the group, and others called intergrades that have properties of the group and also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside of the range of any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group. An example is Typic Ochraquults (typical Ochraquults).

FAMILY. Soil families are separated within a subgroup primarily on the basis of properties important to the growth of plants or on the behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence. A family name consists of a series of adjectives preceding the subgroup name. The adjectives are the class names for texture, mineralogy, and so on, that are used as family differentiae (table 14). An example is the clayey, kaolinitic, thermic family of Typic Ochraquults.

SERIES. The soil series is the lowest category in the classification system. It includes soils that are alike in profile characteristics and have developed in similar parent materials by the same genetic processes. The texture of the surface layer may vary. Soils are classified as they occur in the field based on quantitative characteristics and morphological criteria. Presently there are over 10,000 series, and 18 are recognized in this survey area.

Additional Facts About the County

In this section the climate and physical features of Barnwell County, Eastern Part, and other subjects of general interest are discussed briefly.

TABLE 14.—*Soil series classified according to the current system*

Series	Family	Subgroup	Order
Ailey	Loamy, siliceous, thermic	Arenic Fragiudults	Ultisols.
Blanton	Loamy, siliceous, thermic	Grossarenic Paleudults	Ultisols.
Clarendon	Fine-loamy, siliceous, thermic	Plinthaquic Paleudults	Ultisols.
Dothan	Fine-loamy, siliceous, thermic	Plinthic Paleudults	Ultisols.
Dunbar [1]	Clayey, kaolinitic, thermic	Aeric Paleaquults	Ultisols.
Duplin	Clayey, kaolinitic, thermic	Aquic Paleudults	Ultisols.
Faceville	Clayey, kaolinitic, thermic	Typic Paleudults	Ultisols.
Fuquay	Loamy, siliceous, thermic	Arenic Plinthic Paleudults	Ultisols.
Johnston	Coarse-loamy, siliceous, acid, thermic	Cumulic Humaquepts	Inceptisols.
Lakeland	Siliceous, thermic, coated	Typic Quartzipsamments	Entisols.
Lumbee	Fine-loamy, over sandy or sandy-skeletal, siliceous, thermic.	Typic Ochraquults	Ultisols.
McColl	Clayey, kaolinitic, thermic	Typic Fragiaquults	Ultisols.
Orangeburg	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Pelham [2]	Loamy, siliceous, thermic	Arenic Paleaquults	Ultisols.
Plummer	Loamy, siliceous, thermic	Grossarenic Paleaquults	Ultisols.
Rembert	Clayey, kaolinitic, thermic	Typic Ochraquults	Ultisols.
Varina	Clayey, kaolinitic, thermic	Plinthic Paleudults	Ultisols.
Vaucluse	Fine-loamy, siliceous, thermic	Typic Fragiudults	Ultisols.

[1] The Dunbar soils in Barnwell County, Eastern Part, are taxadjuncts to the Dunbar series. They have slightly more clay in the upper part of the B2t horizon than is defined for the series.

[2] The Pelham soils in Barnwell County, Eastern Part, are taxadjuncts to the Pelham series. They have slightly higher chromas in the A2 and A3 horizons than are defined for the series.

Climate [6]

The climate of Barnwell County, Eastern Part, is mild and temperate, and rainfall is well distributed throughout the year. The day-to-day weather is controlled largely by the march of pressure systems across the nation, although during the summer there are relatively few complete exchanges of air masses as tropical maritime air persists for extended periods. Wind, humidity, and sunshine records are not available from Barnwell County, Eastern Part, or from any of the contiguous counties.

The nearest conveniently available wind, humidity, and sunshine records are at Augusta, Georgia. This information may also be extracted by interpolation from the National Atlas of the United States. Averages from these sources indicate that the prevailing winds are from the southeast, except during the fall and winter months when the dominating winds become northwesterly. The average wind speed was about 7 miles per hour, while the strongest 1-minute wind speed in recent years was 62 miles per hour for the Augusta, Georgia, area. The latest averages for 1:00 p.m. relative humidity varied from a maximum of 57 percent in September to a minimum of 49 percent in April and May. The average relative humidity, for the year as a whole, is about 76 percent.

An average year in Barnwell County, Eastern Part, produces about 77 days with 0.10 inch or more of precipitation, about 34 days with 0.5 inch or more, and some 16 days with 1 inch or more of rain.

The heaviest total annual rainfall for this general area during the last 70 years was 75.10 inches observed at Blackville in 1964. The least annual rainfall recorded, 27.85 inches, occurred at Blackville in 1954.

The sun is visible during about 65 percent of the daylight hours during the year, with percentages ranging from the low fifties during the winter to the low seventies during the summer. The skies are cloudy to overcast about 40 percent of the time. About 2 percent of the time the cloud bases are below 500 feet, and 6 percent of the time they are below 1,000 feet.

Summers are generally long, with warm weather lasting from sometime in May to the middle of September. Relatively few breaks in the heat occur during midsummer. On an average the typical summer has about 4 days with maximum temperatures of 100° F or more (one day each month, June through September). An occasional 100° temperature is observed in May. On an average there are 71 days with temperatures of 90° or higher. The temperature exceeds 100° at least once during most summers. Summer is the rainiest season of the year in Barnwell County, Eastern Part. The three summer months provide 33 percent of the annual total precipitation. The summer rains are largely in the form of local thundershowers. Tropical storms affect Barnwell County, Eastern Part, on an average of one or two per decade, and they bring strong winds and heavy rains, which commonly cause relatively minor damage. These storms are a threat from midsummer through late fall, with the greatest incidence during September.

The fall season, a transition between extremes, has summer weather early in September, then passes through the "Indian Summer" to the prewinter cold spells, which begin to be felt late in November. On the whole this is the most pleasant season, especially from late September to early November when rainfall is light, sunshine is at a relative maximum, and temperature extremes are practically nonexistent. September, the month of greatest hurricane frequency, has had heavy to excessive rains accompanied by strong winds from nearby tropical storms about five times in 30 consecutive years. Damage and

[6] By Norton D. Strommen, climatologist for South Carolina, National Weather Service, U.S. Department of Commerce.

TABLE 15.—*Temperature and precipitation*

[All data from Blackville]

Month	Temperature				Precipitation			
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with—		Average monthly total	One year in 10 will have—		Average depth of snow
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—	
	°F	°F	°F	°F	*Inches*	*Inches*	*Inches*	*Inches*
January	60	38	78	20	2.7	1.1	4.8	0.2
February	62	39	78	21	3.7	1.2	6.4	.5
March	68	44	82	28	4.2	1.5	7.4	.1
April	77	52	87	38	3.7	1.6	7.4	0
May	85	60	93	48	3.5	1.4	6.0	0
June	91	68	97	58	4.3	1.9	6.5	0
July	92	70	97	63	5.0	2.2	8.5	0
August	91	69	98	62	4.9	2.4	10.0	0
September	87	65	94	52	4.1	1.7	7.1	0
October	78	54	88	39	2.7	.4	5.2	0
November	68	43	86	27	2.5	.4	4.5	(1)
December	59	37	75	22	3.3	1.0	5.8	0.1
Year	76	53	[2] 103	[3] 17	44.6	33.5	51.8	0.9

[1] Less than 0.05 inch.
[2] Average highest normal temperature.
[3] Average annual lowest temperature.

TABLE 16—*Probabilities of last freezing temperature in spring and first in fall*

[All data from Blackville]

Probability	Dates for given probability and temperature		
	24° F or lower	28° F or lower	32° F or lower
Spring: 1 year in 10 later than	March 5	March 22	April 8
2 years in 10 later than	February 25	March 15	March 31
5 years in 10 later than	February 9	March 1	March 17
Fall: 1 year in 10 earlier than	November 21	November 12	November 3
2 years in 10 earlier than	November 27	November 17	November 8
5 years in 10 earlier than	December 8	November 27	November 18

TABLE 17.—*Probability of drought days on soils of different available water capacities*

Month [1]	Probability	Minimum number of drought days if soil has available water capacity [2]				
		1 inch	2 inches	3 inches	4 inches	5 inches
April.	1 in 10	16	9	0	0	0
	2 in 10	14	6	0	0	0
	3 in 10	12	0	0	0	0
	5 in 10	10	0	0	0	0
May.	1 in 10	26	25	20	15	9
	2 in 10	23	21	16	11	0
	3 in 10	21	18	14	8	0
	5 in 10	18	14	9	0	0
June.	1 in 10	22	20	20	18	16
	2 in 10	20	17	16	14	12
	3 in 10	18	15	13	11	9
	5 in 10	15	11	8	6	0
July.	1 in 10	21	18	17	16	15
	2 in 10	18	14	13	12	10
	3 in 10	15	11	10	8	7
	5 in 10	11	6	5	0	0
August.	1 in 10	19	15	11	10	8
	2 in 10	16	11	7	5	0
	3 in 10	14	8	5	0	0
	5 in 10	11	0	0	0	0
September.	1 in 10	22	20	16	15	13
	2 in 10	19	16	12	10	7
	3 in 10	16	13	8	6	0
	5 in 10	13	7	0	0	0
October.	1 in 10	26	25	23	21	17
	2 in 10	22	19	15	12	9
	3 in 10	19	15	10	5	0
	5 in 10	15	8	0	0	0

[1] Months of January, February, March, November, and December are not shown because crops are rarely damaged by drought in these months.

[2] Available water capacity expressed as inches of water.

casualties were negligible. The fall rainfall is about 19 percent of the annual total.

People in the area enjoy mild and relatively short winters, with freezing temperatures recorded only about one-third of the winter days. On only 5 days in the last 30 years have maximum temperatures of 32° or lower occurred at Blackville. Generally there is a good chance of snow flurries during the winter but only occasionally will a significant snowfall occur. Thus, extended periods with significant snow cover, such as the 12 inches of snow in February of 1973, are unusual. For 30 consecutive years winter has averaged about 4 days with temperatures of 20° and below, and less than 1 day has had a temperature of 15° or less. Only infrequently will a reading of less than 10° F be observed. The winter rains are usually steady, with about 23 percent of the annual precipitation falling during this season.

Spring, the most changeable period of the year, varies from frequently cold and windy in March to generally warm and pleasant in May. This is the season when severe local thunderstorms and tornadoes are most frequently observed in South Carolina. Barnwell County, Eastern Part, has experienced five tornadoes in the last 53 years. The spring rainfall represents about 25 percent of the annual total.

Climatic data for the survey area are summarized in tables 15, 16, and 17.

Significant farm products in Barnwell County, Eastern Part, are cotton, corn, watermelons, peaches, and soybeans. Climatic conditions favor these and many truck crops. The soils accumulate moisture in winter and spring, so that soil moisture is ordinarily near field capacity during the planting season. Nevertheless, sufficiently dry periods permit tillage. The freeze-free interval, known as the growing season, lasts from March 17 to November 18, or about 245 days (table 16)—long enough for crops to be planted over a period of weeks, or even months, and still have sufficient time to mature (*7*).

The amount of rainfall during the growing season is normally suitable for crop development, but in some years it may be either inadequate or excessive. For example, data in table 15 indicate that extreme monthly and annual rainfall deficiencies might occur once in about 10 years and that extreme excesses might also occur once in 10 years. To illustrate, while the average rainfall in July is 5.0 inches, 1 July in 10 may have less than 2.2 inches and another July during a 10-year period may have more than 8.5 inches.

Disastrous droughts occurred in 1925 and 1954. Partial droughts are more frequent and occur once or twice every 10 years. One approach to the discussion of drought can be found in a Clemson University publication, "Agricultural Drought in South Carolina." By definition, a drought occurs when there is no water available in the soil for the plant. A drought day is a day during which no water is available to the plant. Calculation of these values involves keeping a water balance with proper attention to the available water capacity of the soil, precipitation, and the amount of water used or transpired by the plant. This study reveals that even in a normal year there are periods when rainfall does not amply supply the water needs of most crops.

This means that supplementary irrigation is needed for maximum crop production in most sections of the county during most years. During a severe drought, however, the water supply for irrigation is often very limited or nonexistent. Estimates of the frequency of drought days in Barnwell County, Eastern Part, are shown on table 17. These estimates were obtained by using the Penman method for computing the consumption of soil moisture by both plants and evaporation or "evapotranspiration," and by defining a drought day as stated earlier. The total possible amount of stored moisture available to plants varies with soils and depths of roots. The table shows, therefore, the estimated number of drought days at five levels of available water capacity for four probability levels. For example, during July on a soil with a 2-inch storage capacity, there is a 50-50 chance of accumulating six drought days in Barnwell County, Eastern Part.

Physiography, Drainage, and Geology

Barnwell County, Eastern Part, is in the Atlantic Coastal Plain physiographic province. Major Land Resource Areas are the Southern Coastal Plain and the Georgia and Carolina Sandhills. Being just below the fall line, the land is characterized by rolling or undulating areas and broad flat or nearly level areas. Many oval-shaped depressions called Carolina bays are present. They range from less than an acre to about 100 acres in size. The soils are sedimentary and were transported and deposited by the Atlantic Ocean or the rivers in the area.

Barnwell County, Eastern Part, ranges from about 105 feet above sea level where the Salkehatchie River leaves the county to about 380 feet in the vicinity northwest of Williston near the Aiken County line. Overall slope is from the northwest to the southeast.

The primary drainageways are South Fork Edisto River on the north and Salkehatchie River in the central part. Numerous creeks and branches originate in the survey area.

Streams, ponds, and drilled wells are the chief sources of water for livestock. Water used for irrigation is taken from streams and ponds. Dug or drilled wells supply ample water for rural homes.

According to C. Wythe Cooke (*3*), the geology of Barnwell County, Eastern Part, is influenced by the marine terrace formations resulting from deposits and removals made during alternating advances and retreats of the Atlantic Ocean. The oldest landform is part of the Aiken Plateau. The stream divide running from west of Williston to Blackville is part of this landform.

The oldest coastal terrace is the Brandywine Terrace, which is at about 215 to 270 feet, near sea level. More recent is the Coharie Terrace at 170 to 215 feet, and still younger is the Sunderland Terrace with an upper elevation of about 170 feet (*3*).

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Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Area reclaim. Borrow areas that are difficult to reclaim. Revegetation and erosion control on these areas are extremely difficult.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: clay coat, clay skin.

Compressible. The soil is relatively soft and decreases excessively in volume when a load is applied.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Drainage class (natural). Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low available water capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and mottling in the lower B and the C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time, and some soils commonly have mottling at a depth below 6 to 16 inches.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Cutbanks cave. Walls of cuts are not stable. The soil sloughs easily.

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants, when other growth factors such as light, moisture, temperature, and the physical condition of the soil are favorable.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic-matter content and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Gleyed soil. A soil in which waterlogging and lack of oxygen have caused the material in one or more horizons to be neutral gray in color. The term "gleyed" is applied to soil horizons with yellow and gray mottling caused by intermittent waterlogging.

Illuviation. The accumulation of material in a soil horizon through the deposition of suspended material and organic matter removed from horizons above. Since part of the fine clay in the B horizon (or subsoil) of many soils has moved into the B horizon from the A horizon above, the B horizon is called an illuvial horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Landscape. All the characteristics that distinguish a certain kind of area on the earth's surface and give it a distinguishing pattern, in contrast to other kinds of areas. Any one kind of soil is said to have a characteristic natural landscape, and under different uses it has one or more characteristic cultural landscapes.

Leaching. The removal of soluble materials from soils or other material by percolating water.

Lime. Chemically, lime is calcium oxide (CaO), but its meaning has been extended to include all limestone-derived materials applied to neutralize acid soils. Agricultural lime can be obtained as ground limestone, hydrated lime, or burned lime, with or without magnesium minerals. Basic slag, oystershells, and marl also contain calcium.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state. In engineering, a high liquid limit indicates that the soil has a high content of clay and a low capacity for supporting loads.

Low strength. The soil has inadequate strength to support loads.

Mineral soil. Soil composed mainly of inorganic (mineral) material and low in content of organic material. Its bulk density is greater than that of organic soil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and their thickness and arrangement in the soil profile.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Muck. An organic soil consisting of fairly well decomposed organic material that is relatively high in mineral content, finely divided, and dark in color.

Nodule. A structure developed on the roots of most legumes and a few other plants in response to the stimulus of root-nodule bacteria. Legumes bearing these nodules are nitrogen-fixing plants that use atmospheric nitrogen instead of depending on nitrogen compounds in the soil.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in the production of food and tissue. Nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil and carbon, hydrogen, and oxygen obtained largely from the air and water, are plant nutrients.

Organic matter. A general term for plant and animal material, in or on the soil, in all stages of decomposition. Readily decomposed organic matter is often distinguished from the more stable forms that are past the stage of rapid decomposition.

Parent material. Disintegrated and partly weathered rock from which soil has formed.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Percs slowly. Water moves through the soil slowly, affecting the specified use.

Permeability. The quality that enables the soil to transmit water or air. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

Piping. The soil is susceptible to the formation of tunnels or pipelike cavities by moving water.

Plastic limit. The moisture content at which a soil changes from a semisolid to a plastic state.

Plinthite. More or less clayey, red or dark-red material, ordinarily in the form of mottles and high in iron, that hardens irreversibly if exposed to repeated alternate wetting and drying. In a moist soil, plinthite can be cut with a spade, whereas ironstone, the irreversibly hardened equivalent, cannot be cut but may be broken or shattered with a spade.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Mildly alkaline	7.4 to 7.8
Very strongly acid	4.5 to 5.0	Moderately alkaline	7.9 to 8.4
Strongly acid	5.1 to 5.5	Strongly alkaline	8.5 to 9.0
Medium acid	5.6 to 6.0	Very strongly alkaline	9.1 and higher
Slightly acid	6.1 to 6.5		
Neutral	6.6 to 7.3		

Relief. The elevations or inequalities of a land surface, considered collectively.

Rooting depth. A layer that greatly restricts the downward rooting of plants occurs at a shallow depth.

Runoff (hydraulics). The part of the precipitation upon a drainage area that is discharged from the area in stream channels. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called groundwater runoff or seepage flow from groundwater.

Sand. Individual rock or mineral fragments in a soil that range in diameter from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Seepage. Water moves through the soil so quickly that it affects the specified use.

Series, soil. A group of soils developed from a particular type of parent material and having genetic horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement in the profile.

Shrink-swell. The soil expands on wetting and shrinks on drying, which may cause damage to roads, dams, building foundations, or other structures.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Site index. A numerical means of expressing the quality of a forest site that is based on the height of the dominant stand at an arbitrarily chosen age; for example, the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years.

Slow intake. Water infiltrates slowly into the soil.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles) adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer. Suitable soil material is not thick enough for use as borrow material or topsoil.

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil. A presumed fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Unstable fill. Banks of fill are likely to cave in or slough.

Upland (Geology). Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

Weathering. All physical and chemical changes produced in rocks at or near the earth's surface by atmospheric agents. These changes result in more or less complete disintegration and decomposition of the rock.

Windbreak. Any shelter that protects from the wind. A vegetative windbreak is a strip of closely spaced trees or shrubs that is planted primarily to deflect wind currents and thereby reduce soil blowing, control snow drifting, conserve moisture, and protect crops, orchards, livestock, and buildings.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, including information on use and management, read both the description of the mapping unit and the description of the soil series to which the mapping unit belongs. The capability classification is explained in pages 23 to 25.

Map symbol	Mapping unit	Described on page	Capability unit	Woodland suitability group
			Symbol	Symbol
AeC	Ailey sand, 6 to 10 percent slopes	6	IVs-2	4s2
AeD	Ailey sand, 10 to 15 percent slopes	6	VIe-1	4s2
BaB	Blanton sand, 0 to 6 percent slopes	7	IIIs-1	3s2
BaC	Blanton sand, 6 to 10 percent slopes	7	IVe-1	3s2
Cd	Clarendon loamy sand	8	IIw-2	2w8
DaA	Dothan loamy sand, 0 to 2 percent slopes	9	IIs-2	2o1
DaB	Dothan loamy sand, 2 to 6 percent slopes	9	IIe-5	2o1
DaC	Dothan loamy sand, 6 to 10 percent slopes	9	IIIe-1	2o1
Db	Dunbar sandy loam	10	IIw-5	2w8
DpA	Duplin sandy loam, 0 to 2 percent slopes	11	IIw-5	2w8
FaB	Faceville loamy sand, 2 to 6 percent slopes	12	IIe-2	3o1
FaC	Faceville loamy sand, 6 to 10 percent slopes	12	IIIe-2	3o1
FuA	Fuquay sand, 0 to 2 percent slopes	12	IIs-1	3s2
FuB	Fuquay sand, 2 to 6 percent slopes	12	IIs-1	3s2
FuC	Fuquay sand, 6 to 10 percent slopes	13	IIIe-5	3s2
JO	Johnston soils	13	VIIw-3	1w9
LaB	Lakeland sand, 0 to 6 percent slopes	14	IVs-1	4s2
LaC	Lakeland sand, 6 to 10 percent slopes	14	VIs-1	4s2
Lu	Lumbee loamy sand	15	IIIw-4 drained Vw-1 undrained	2w9
Mc	McColl loam	15	IIIw-2 drained Vw-1 undrained	2w9
OrA	Orangeburg loamy sand, 0 to 2 percent slopes	16	I-1	2o1
OrB	Orangeburg loamy sand, 2 to 6 percent slopes	17	IIe-1	2o1
OrC	Orangeburg loamy sand, 6 to 10 percent slopes	17	IIIe-1	2o1
Pe	Pelham sand	17	IVw-3	2w3
Pu	Plummer loamy sand	18	IVw-3	2w3
Re	Rembert loam	18	IIIw-2 drained Vw-1 undrained	2w9
VaA	Varina loamy sand, 0 to 2 percent slopes	19	IIs-2	3o1
VaB	Varina loamy sand, 2 to 6 percent slopes	19	IIe-2	3o1
VaC	Varina loamy sand, 6 to 10 percent slopes	19	IIIe-2	3o1
VcB	Vaucluse loamy sand, 2 to 6 percent slopes	20	IIIe-4	3o1
VcC	Vaucluse loamy sand, 6 to 10 percent slopes	20	IVe-4	3o1
VcD	Vaucluse soils, 10 to 25 percent slopes	21	VIe-1	3o1

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SOIL ASSOCIATIONS

1 — Johnston association: Nearly level, very poorly drained soils that are dominantly loamy throughout

2 — Varina-Fuquay-Dothan association: Nearly level to sloping, well-drained soils that have a sandy surface layer and a clayey or loamy subsoil

3 — Blanton-Fuquay-Lakeland association: Nearly level to sloping, well-drained soils that have a sandy surface layer and a loamy subsoil, and excessively drained soils that are sandy throughout

4 — Fuquay-Blanton-Dothan association: Nearly level to sloping, well-drained soils that have a sandy surface layer and a loamy subsoil

5 — Rembert association: Nearly level, poorly drained soils that have a loamy surface layer and a clayey subsoil

Compiled 1975

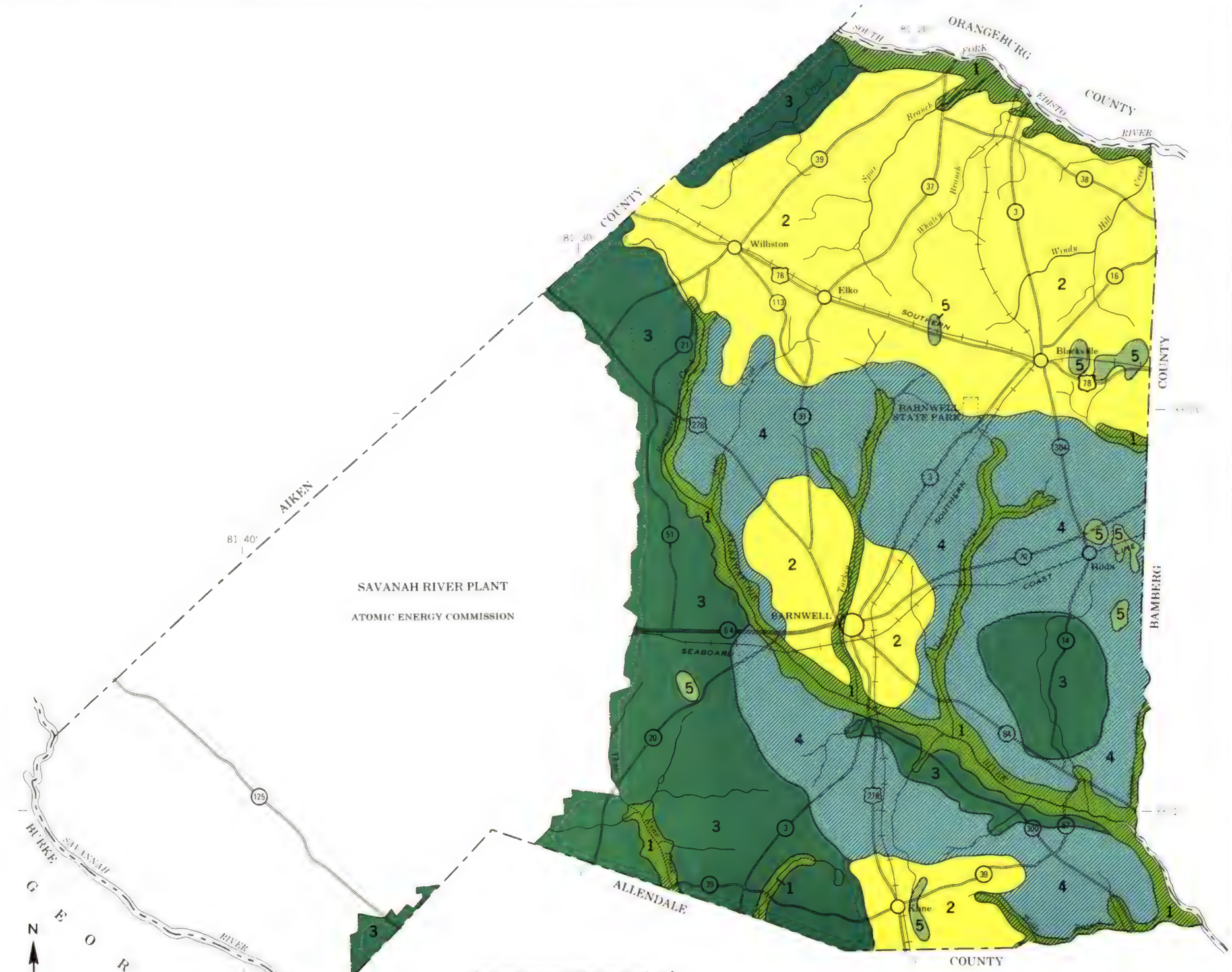
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SOUTH CAROLINA AGRICULTURAL EXPERIMENT STATION AND
THE SOUTH CAROLINA LAND RESOURCES CONSERVATION COMMISSION

GENERAL SOIL MAP

BARNWELL COUNTY, SOUTH CAROLINA

Scale 1:190,080
1 0 1 2 3 4 Miles

SAVANAH RIVER PLANT
ATOMIC ENERGY COMMISSION

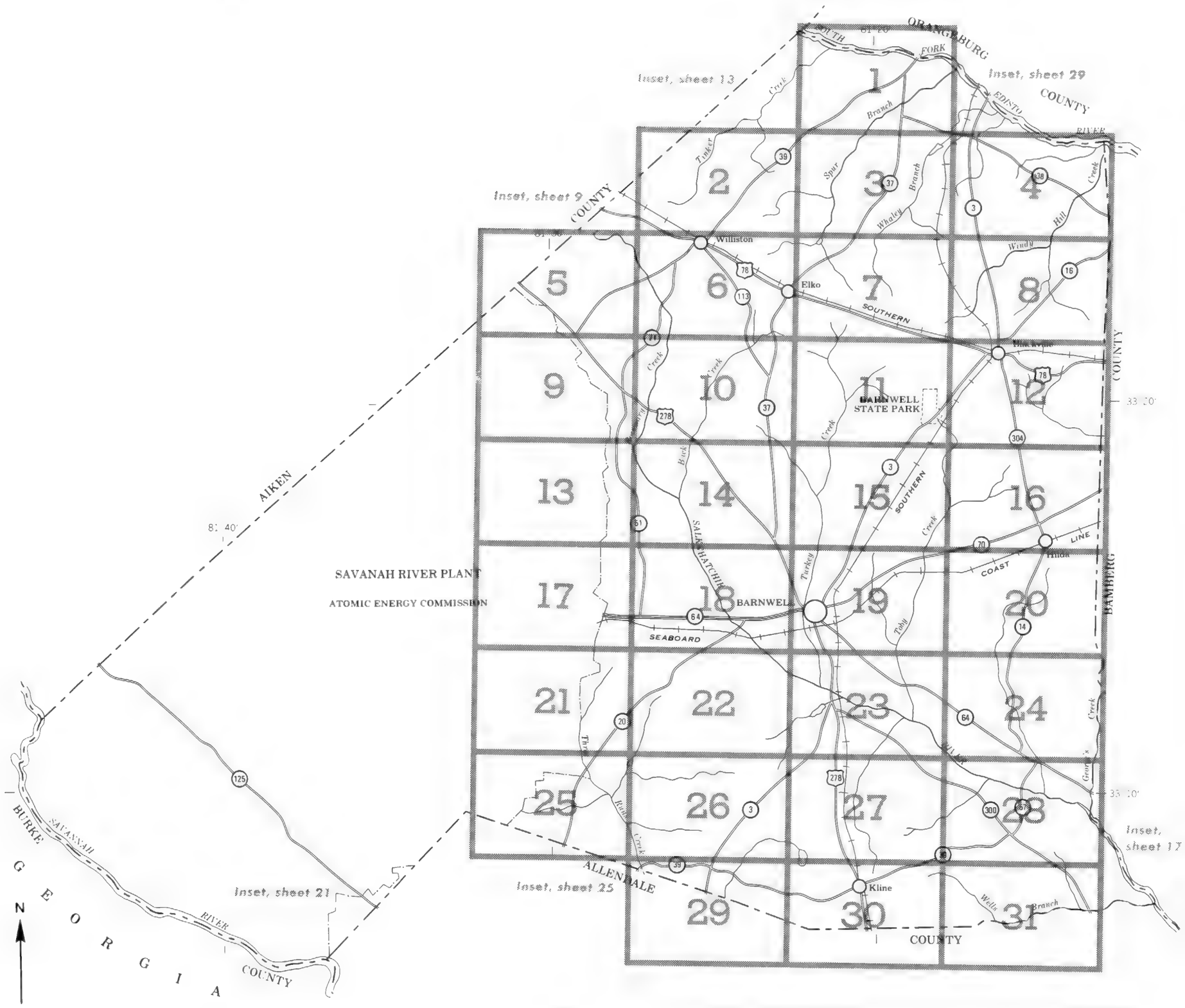


Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

INDEX TO MAP SHEETS
BARNWELL COUNTY, SOUTH CAROLINA

Scale 1:190,080

1 0 1 2 3 4 Miles



SOIL LEGEND

The first capital letter is the initial one of the soil name. The second letter is lower case for a detailed map unit and a capital for a reconnaissance map unit. 1/ The third letter, if used, is a capital and connotes slope class. Symbols without a slope letter are for nearly level soils.

SYMBOL	NAME
AeC	Ailey sand, 6 to 10 percent slopes
AeD	Ailey sand, 10 to 15 percent slopes
BaB	Blanton sand, 0 to 6 percent slopes
BaC	Blanton sand, 6 to 10 percent slopes
Cd	Clarendon loamy sand
DaA	Dothan loamy sand, 0 to 2 percent slopes
DaB	Dothan loamy sand, 2 to 6 percent slopes
DaC	Dothan loamy sand, 6 to 10 percent slopes
Db	Dunbar sandy loam
DpA	Duplin sandy loam, 0 to 2 percent slopes
FaB	Faceville loamy sand, 2 to 6 percent slopes
FaC	Faceville loamy sand, 6 to 10 percent slopes
FuA	Fuquay sand, 0 to 2 percent slopes
FuB	Fuquay sand, 2 to 6 percent slopes
FuC	Fuquay sand, 6 to 10 percent slopes
JO	Johnston soils
LaB	Lakeland sand, 0 to 6 percent slopes
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Mc	McColl loam
OrA	Orangeburg loamy sand, 0 to 2 percent slopes
OrB	Orangeburg loamy sand, 2 to 6 percent slopes
OrC	Orangeburg loamy sand, 6 to 10 percent slopes
Pe	Pelham sand
Pu	Plummer loamy sand
Re	Rembert loam
VaA	Varina loamy sand, 0 to 2 percent slopes
VaB	Varina loamy sand, 2 to 6 percent slopes
VaC	Varina loamy sand, 6 to 10 percent slopes
VcB	Vaucluse loamy sand, 2 to 6 percent slopes
VcC	Vaucluse loamy sand, 6 to 10 percent slopes
VcD	Vaucluse soils, 10 to 25 percent slopes

1/ Delineations generally are much larger and the composition of the unit is apt to be more variable than for others in the survey area. Mapping has been controlled well enough, however, for the anticipated uses of the areas involved.

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool (Davis Airstrip; FLOOD POOL LINE)

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEMS & DESIGNATIONS

- Interstate (79)
- Federal (410)
- State (52)
- County, farm or ranch (378)

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small (water)

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) (Indian Mound)
- Located object (label) (Tower)
- Tank (label) (GAS)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) (CANAL)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial (water)
- Intermittent

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS (CeA, FoB2)

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown)

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot
- Dug pond (less than 5 acres)

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART — SHEET NUMBER 1

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 1

SOUTH FORK ORANGEBURG COUNTY EDISTO RIVER

Tinker Creek

Branch

Spur

AIKEN CO

(Joins inset, sheet 13)

(Joins inset, sheet 29)

(Joins sheet 3)

JO

N

1 Mile

5000 Feet

Scale 1:20000

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART — SHEET NUMBER 2

(2)

N

1 Mile

5000 Feet

Scale 1:20000

(Joins inset, sheet 13)

(Joins inset, sheet 9)

(Joins sheet 6)

(Joins sheet 3)

AIKEN COUNTY

WILLISTON

Creek

Thicket

Water

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 2

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART — SHEET NUMBER 3

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART — NO. 3

(Joins sheet 1)

(Joins sheet 2)

(Joins sheet 4)

(Joins sheet 7)

N

Scale 1:20000

1 Mile

5,000 Feet

(4)

N

1 Mile

5,000 Feet

Scale 1:20000

(Joins inset, sheet 29)

(Joins sheet 3)

(Joins sheet 8)

SOUTH FORK EDISTO RIVER

ORANGEBURG COUNTY

BAMBERG COUNTY

Creek

Hull

Windy

water

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 4


(Joins inset, sheet 9)
(Joins sheet 6)
(Joins sheet 9)
AIKEN COUNTY
SAVANNAH RIVER
PLANT
BOUNDARY
278
39
381
217
164
62
Scale 1:20000
1 Mile
5000 Feet
1000
2000
3000
4000
5000

5

N

6

N

Scale 1:20000

1 Mile

5000 Feet

(Joins sheet 2)

(Joins sheet 5)

(Joins sheet 7)

(Joins sheet 10)

WILLISTON

SOUTHERN

Rosemary

Creek

water

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 6


(Joins sheet 3)
(Joins sheet 6)
(Joins sheet 11)
(Joins sheet 8)
Edisto Experiment Station
Reynolds
BLACKVILLE
SOUTHERN
Scale 1:20000
1 Mile
5,000 Feet
N
7

(Joins sheet 4)

(Joins sheet 7)

(Joins sheet 12)

8

N

1 Mile

5000 Feet

Scale 1 : 20000

BLACKVILLE

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 8

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 8

9

N

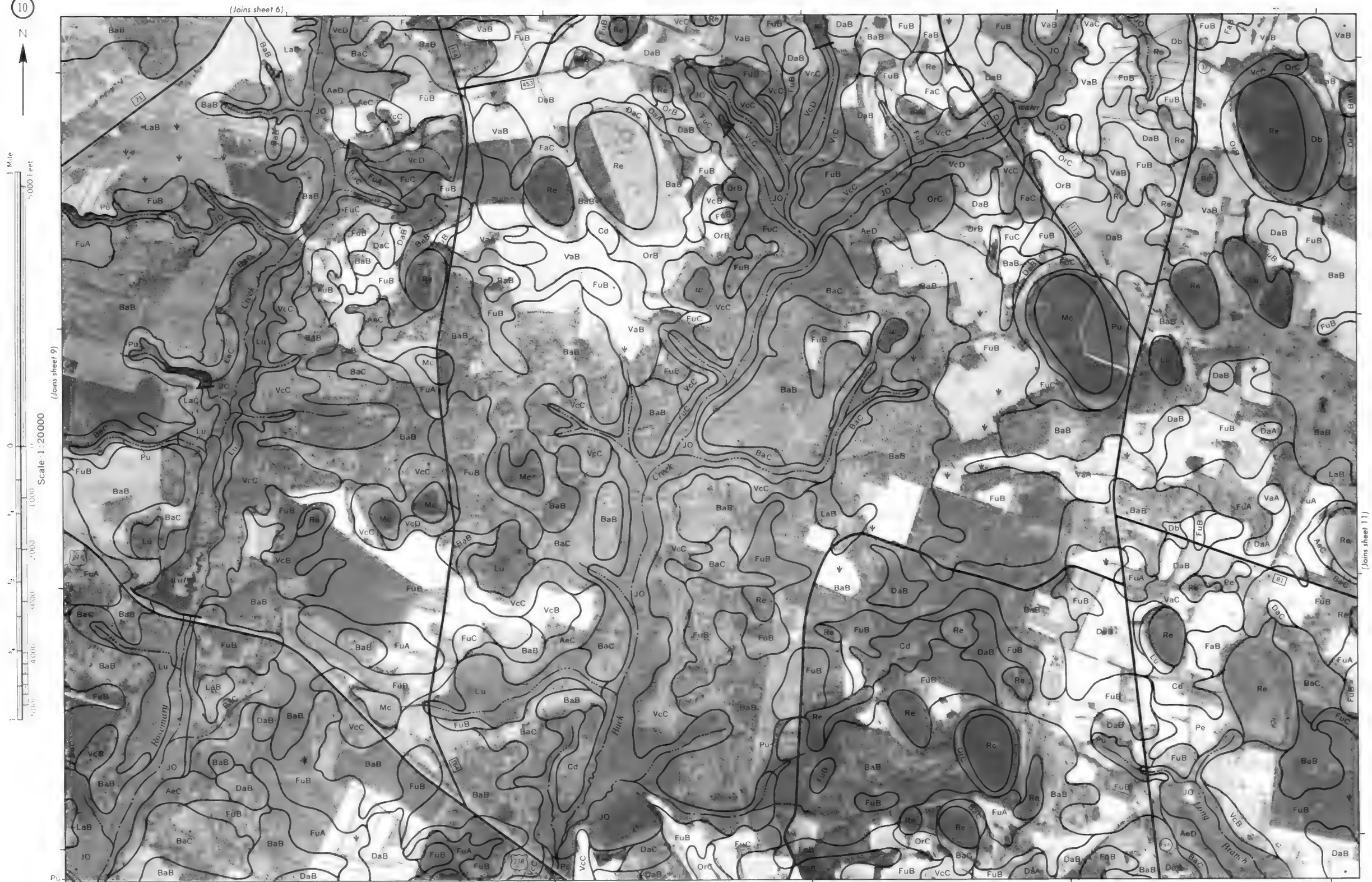
Scale 1:20000

1 Mile

5000 Feet

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 9

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART — SHEET NUMBER 10



BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART — SHEET NUMBER 10

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 11

12

N

Scale 1:20000

1 Mile 5000 Feet

(Joins sheet 8)

(Joins sheet 11)

(Joins sheet 16)

BLACKVILLE

SOUTHERN

water

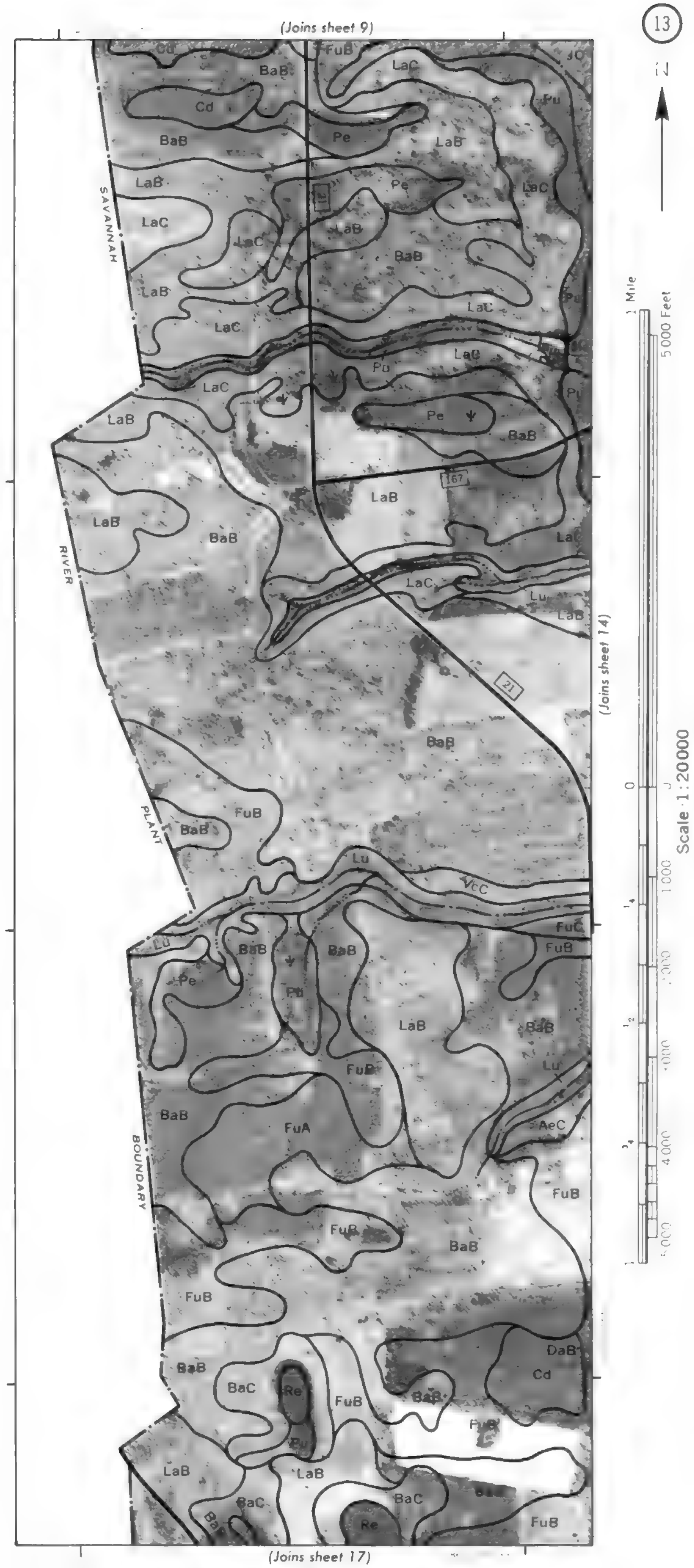
Little Salkehatchie Creek

BARNWELL COUNTY

BAMBERG COUNTY

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 12

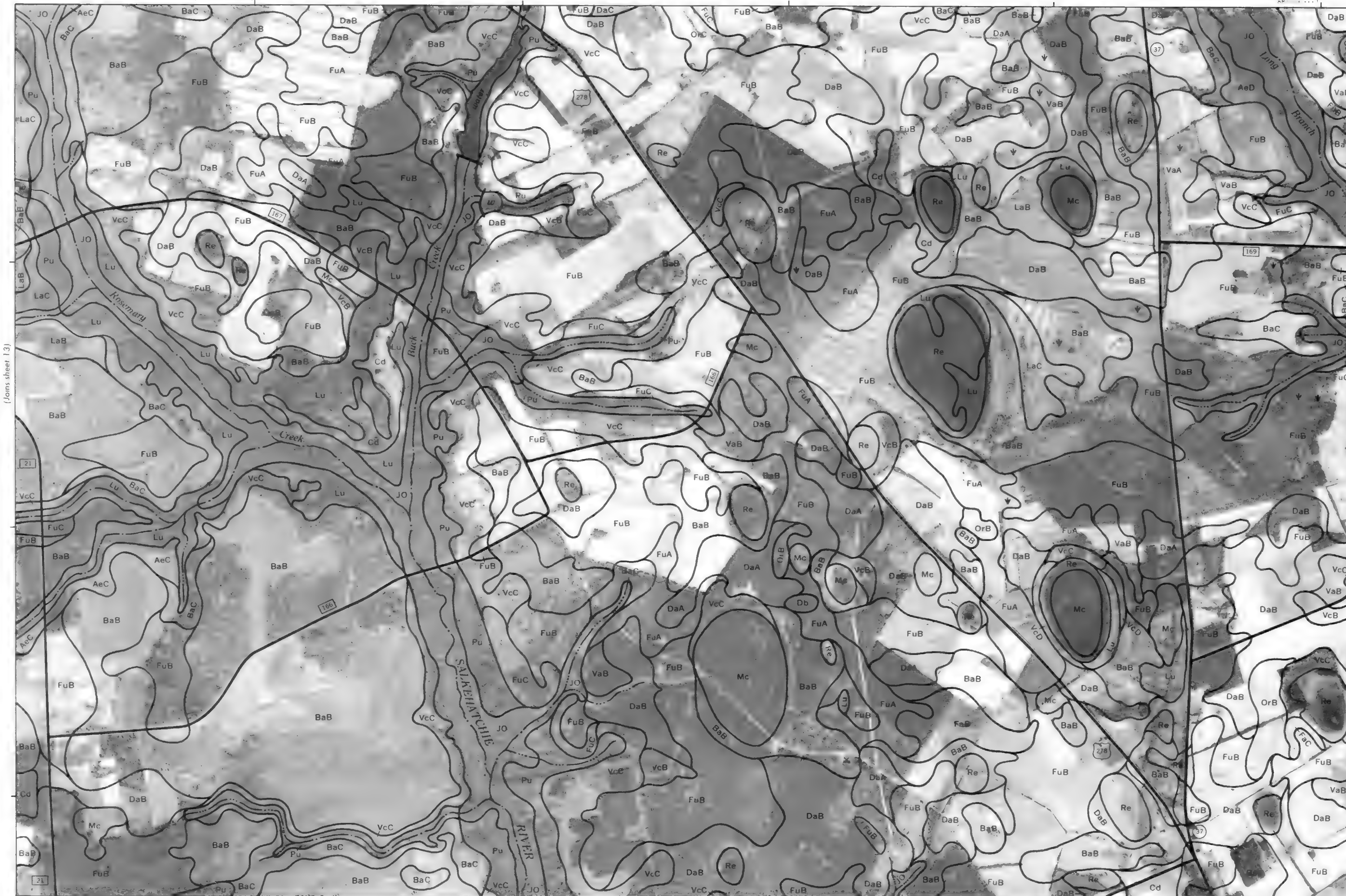
BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 13



14

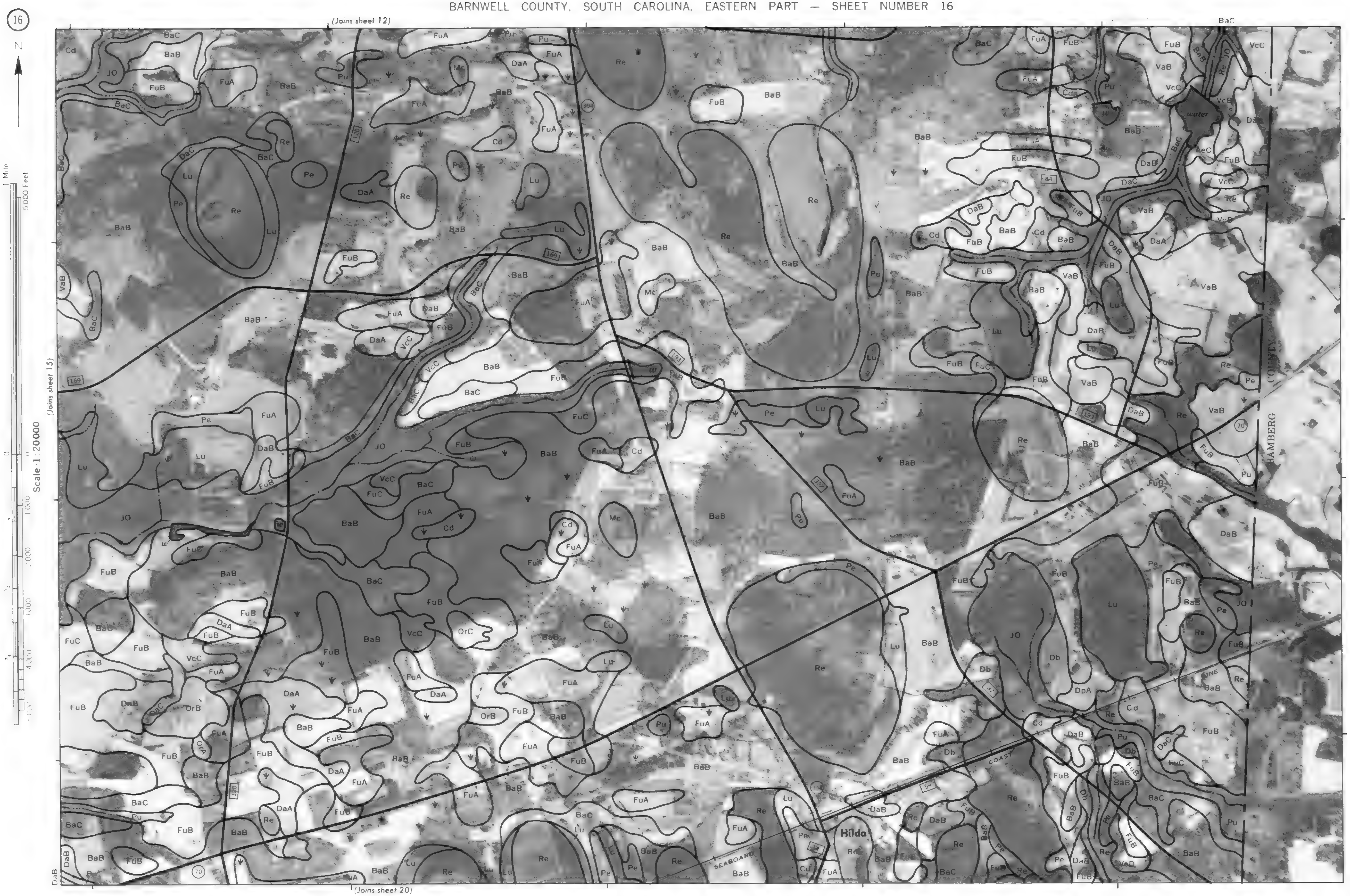
N

Scale 1:20000



BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 14


(Joins sheet 11)
(Joins sheet 14)
(Joins sheet 16)
(Joins sheet 19)
Ashleigh
Yale
Creek
Branch
Turkey
Tobly
Water
SOUTHERN
168
160
16
41
15
N
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
4000


16
N
(Joins sheet 12)
(Joins sheet 15)
(Joins sheet 20)
1 Mile
5000 Feet
Scale 1:20000
water
Hilda
SEABOARD
COAST LINE
BAMBERG COUNTY


17
N
(Joins sheet 13)
(Joins sheet 18)
(Joins sheet 21)
(Joins sheet 31)
(Joins sheet 28)
1 935 000 FEET
1 940 000 FEET
475 000 FEET
Salkehatchie
BAMBERG COUNTY
River
Wells
Branch
ALLENDALE COUNTY
SEABOARD COAST LINE
BOUNDARY
PLANT
RIVER
SAVANNAH
Snelling
1 Mile
5000 Feet
Scale 1:20000
JO
BaB
BaC
FuB
FuA
FuC
VcD
LaB
LaC
Lu
Pu
Pe
Re
DaB
DaA
AeC
Cd
Mc
53
64
585

18

N

1 Mile
5000 Feet
0
Scale · 1 : 20000
1000
2000
3000
4000
5000

(Joins sheet 14)

885 000 FEET

(Joins sheet 17)

(Joins sheet 19)

(Joins sheet 22)

BARNWELL COUNTY AIRPORT

BARNWELL (county seat)

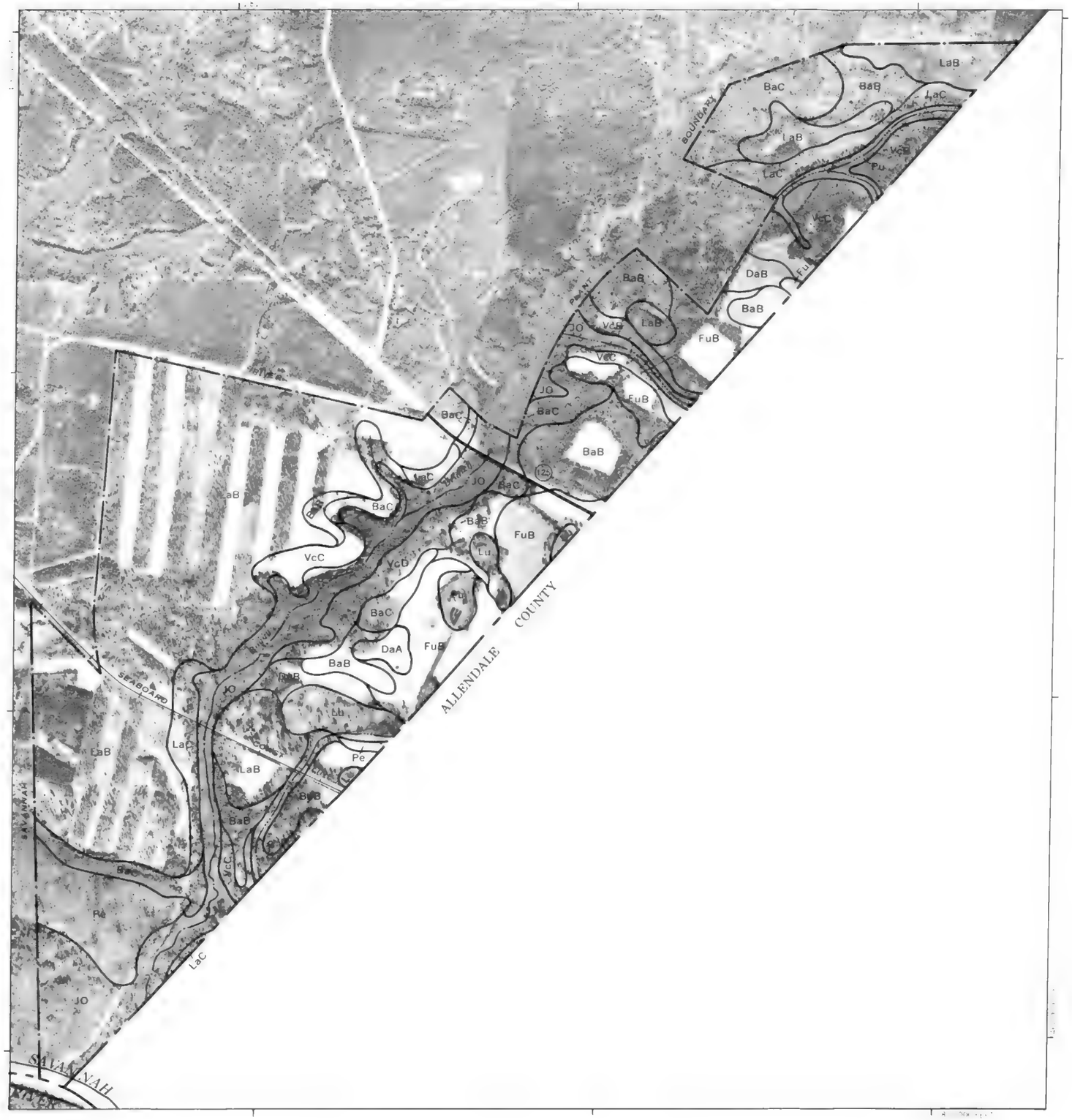
SEABOARD COAST LINE

Salkehatchie River

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART — NO. 18

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 19


20
N
(Joins sheet 16)
(Joins sheet 19)
(Joins sheet 24)
Hilda
BAMBERG COUNTY
SEABOARD
COAST
LINE
Hercules
Creek
1 Mile
5000 Feet
Scale 1:20000



(Joins sheet 17)

(Joins sheet 22)

(Joins sheet 25)

21

N

1 Mile

5000 Feet

0

1:20000

Scale 1:20000

22

N

1 Mile

5000 Feet

Scale 1:20000

0 ½ 1 2 3 4 5

0 1000 2000 3000 4000 5000

(Joins sheet 18)

(Joins sheet 21)

(Joins sheet 23)

(Joins sheet 26)

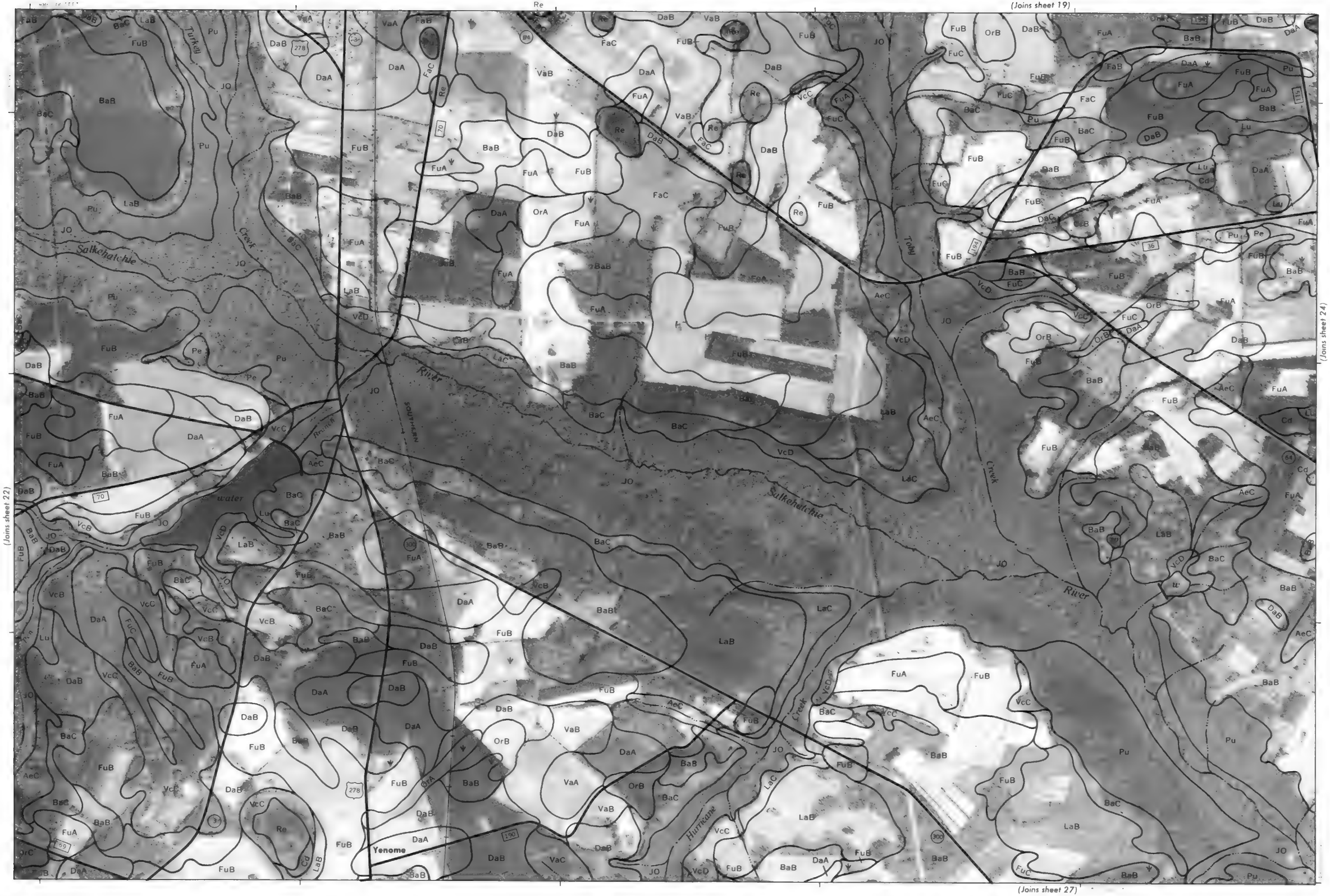
SALKEHATCHIE RIVER

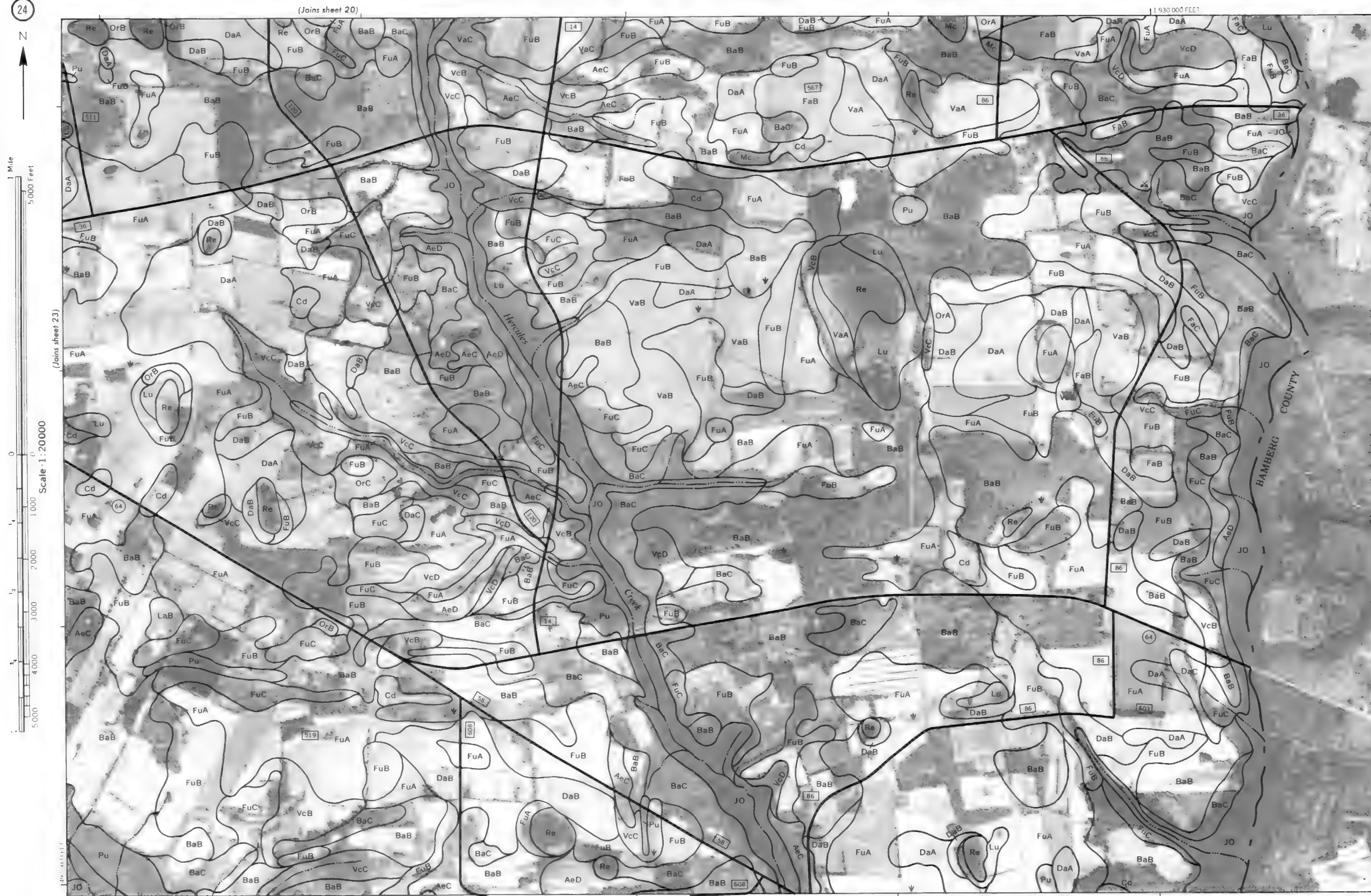
Patterson Branch

Pen Branch

20 573 412 69 520 70

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 22

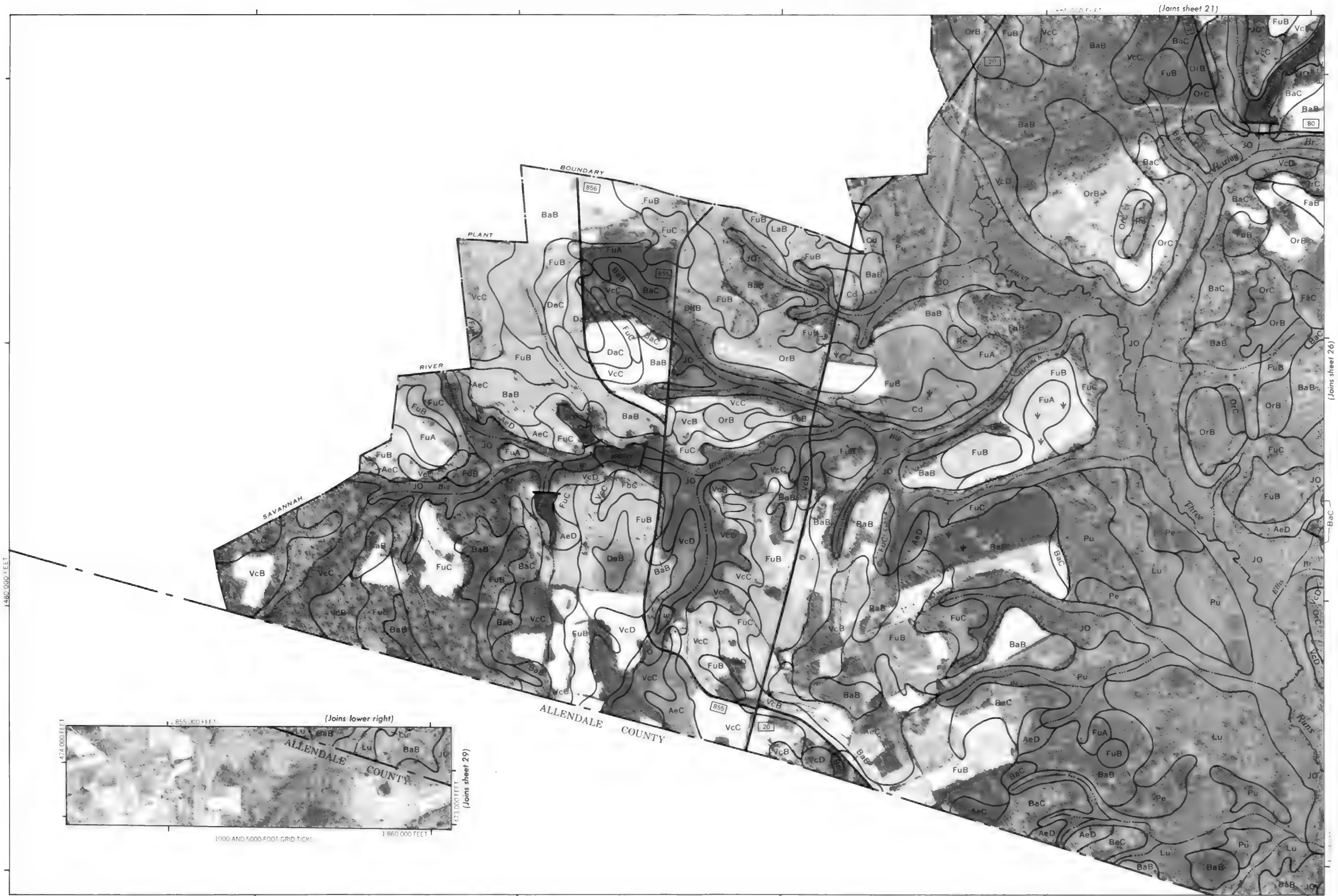

(Joins sheet 19)
(Joins sheet 24)
(Joins sheet 27)
(Joins sheet 22)
Salkehatchie River
Turkey Creek
Tony Creek
Hurricane Creek
Southern Branch water
Yemassee
23
N
1 Mile
5000 Feet
Scale 1:20000



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 25

This map is compiled on 1974 aerial photography by the U.S. Department of Agriculture conservation service, and soil survey data.
Coordinate grid ticks and land division corners (shown are approximate)



26

N

(Joins sheet 22)

1 880 000 FEET

490 000 FEET

(Joins sheet 25)

1 Mile
5000 Feet

Scale 1:20000

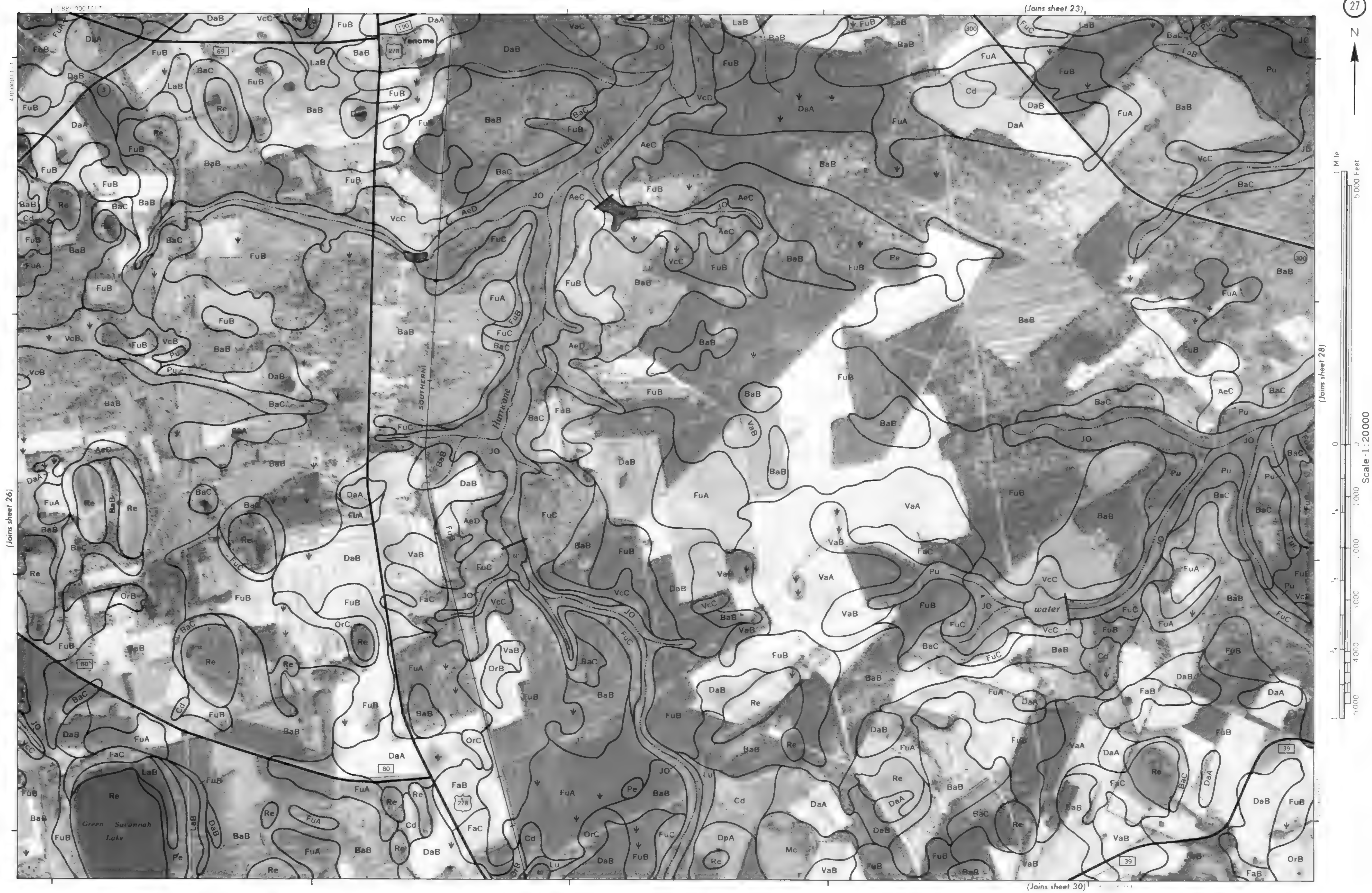
(Joins sheet 27)

1 860 000 FEET

(Joins sheet 29)

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners 1 shown are approximately positioned

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 26


27
N
(Joins sheet 23)
(Joins sheet 26)
(Joins sheet 28)
(Joins sheet 30)
Yenome
Creek
Hurricane
SOUTHERN
water
Green Savannah Lake
1 Mile
5000 Feet
Scale 1:20000

28

N

1 Mile

5,000 Feet

Scale 1:20000

0 1000 2000 3000 4000 5000

(Joins sheet 24)

(Joins sheet 27)

(Joins sheet 31)

(Joins inset, sheet 17)

1 930 000 FEET

490,000 FEET

SALKEHATCHIE RIVER

Hercules Creek

BAMBERG COUNTY

BaB BaC DaA DaB DaC Cd FaB FaC FuA FuB FuC FuE JO Lu OrA OrB OrC Pe Pu Re VaA VaB VaC VcB VcC VcD AeC AeD

This map is compiled on 1:4 aerial photographs by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Soil lines are approximately positioned
Coordinate grid ticks and land division corners if shown are approximately positioned

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 28


29
N
(Joins sheet 26)
(Joins inset, sheet 25)
(Joins sheet 30)
(Joins sheet 1)
(Joins sheet 4)
860 000 FEET
1 920 000 FEET
Lendhurst
ALLENDALE COUNTY
ORANGEBURG COUNTY
SOUTH FORK EDISTO RIVER
Whaley Branch
SOUTHERN
Scale 1:20000
1 Mile
5000 Feet
BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 29


30
N
(Joins sheet 27)
(Joins sheet 29)
(Joins sheet 31)
Kline
ALLENDALE COUNTY
Green Savannah Lake
Scale 1:20000
1 Mile
5000 Feet
1 905 000 FEET
1 885 000 FEET

BARNWELL COUNTY, SOUTH CAROLINA, EASTERN PART NO. 31

(Joins sheet 30)

(Joins sheet 28)

(Joins inset, sheet 17)

ALLENDALE COUNTY

Wells Branch

Wells Branch

N

1 Mile

5,000 Feet

Scale 1:20000